Consumer food choice behavior: underlying preferences, motivations and attitudes

with a focus on alternative proteins

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Today’s consumers and food
Consumers expect reassurance about these attributes, not necessarily during the stage of food purchase, but at any moment that may suit them.
How consumers behaved

- Vigilant and concerned, even when hazards are not relevant;
- Overestimated some risks (esp. technological risks);
- Underestimated other risks (esp. lifestyle hazards);
- Did not differentiate greatly between risks within a category;
- Despite being uncertain, they often remained reluctant to information processing.
Areas of change in public and consumer attitudes towards agriculture and food

1. Interest in **Extrinsic** Quality and related **Information** (availability)
2. Safety less dominant, while **Health** and **Sustainability** gain share
3. **Process quality**, **Eating quality**, and **Convenience**
4. Concern for the **Environment** and attention to **Ethical issues**
5. Mostly as a Citizen, less as Consumer: **Citizen-Consumer Duality**
6. **Acceptability/Acceptance** of innovations not for granted

Power of mass media negative publicity versus positive news (here: BSE versus generic advertising)

Beef expenditure share

Beef advertising (1,000 euro/month)

Negative press response

Advertising response

Negative press (media index)

Verbeke & Ward (2001) Agricultural Economics 25
• Ratio of slopes = 5 to 1
• Five units of positive news needed to offset one unit negative press
Providing easy decision rules

More information on food labels?

- Information overload yielding uncertainty
- Best strategy for consumers to make a decision?
  - Ignore the information
  - Process information systematically
  - Seek and use heuristics (easy decision rules; e.g. brands, labels)
  - Avoid and search for an alternative route (substitutes)
To what extent are you concerned about possible risks associated with food? (n=600; 2012; Belgium; ProSafeBeef study, mean 7-pt scale)

- Pesticides on fruits and vegetables
- Bacteria like salmonella
- Hormone residues in meat
- Residues of antibiotics in meat
- Chemical contaminants like mercury in food
- Unhygienic handling out of home
- Welfare of farm animals
- Additives in food
- New viruses like bird flu
- BSE or mad cow disease
- Genetic modification of food
- Chemicals formed during preparation
- Putting on weight
- Allergens
- Unhygienic handling at home
Consumers’ concerns about food and the food chain
(n=474, Flanders, BE, 2017-2018)

One food group was “more than average” involved in debates and affected:

**Meat**

As a basic source of protein → “The protein transition”
To what extent do you accept to eat protein-enriched food products that contain the following sources of protein?
(n=1,750, UK, NL, SP, PL, FI – age 65-90, 2017)

- Dairy-based: 3.86, 74.8%
- Seafood-based: 3.79, 69.9%
- Meat-based: 3.68, 67.4%
- Plant-based: 3.57, 60.2%
- Single-cell-protein-based: 2.71, 22.5%
- In-vitro-protein-based: 2.12, 6.8%
- Insect-based: 2.08, 10.1%

Source: Grasso et al. (2019) Nutrients 11
Plant-based food
Health, sustainability, perceived match or mismatch

Healthy, sustainable and plant-based eating: Perceived (mis)match and involvement-based consumer segments as targets for future policy

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Abstract
Given the inseparable environmental and health impact of dietary habits, integrating health and sustainability goals has become a highly topical issue in policy development and communication to encourage consumers to adopt healthier and more sustainable diets. Increasing evidence indicates that it is possible to develop diets that are both environmentally sustainable and healthy, but their potential success largely depends on consumers’ willingness and ability to change their behavior. This study investigates consumer perceptions of the match, or mismatch, between healthy and sustainable diets, and gives insight into consumers’ motivation to eat healthily and sustainably, as measured by involvement. Data were collected in Spring 2014 through a cross-sectional quantitative online survey with samples representative for age, gender and region in four European Union (EU) countries (United Kingdom, Germany, Belgium, and the Netherlands) (n = 2783). The images of a healthy diet, a sustainable diet and a plant-based diet were found to be highly comparable based on a strongly observed match between European consumers’ perceptions of these concepts. Half of the participants were highly involved in healthy eating and one third in both healthy and sustainable eating. Informational food policy actions targeting both healthy and sustainable food consumption behavior are recommended to address issues relevant to the target segments, taking into account their levels of involvement. Increasing consumers’ motivation and involvement in health and sustainability emerges as a key trigger for increasing healthy and sustainable eating.

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Consumer segments based on involvement with healthy and sustainable eating
(n=2,720; 2014; BE, NL, UK, DE)

- Uninvolved: 15.4%
- Moderately involved: 30.5%
- Health involved: 22.5%
- Health and sustainability involved: 31.6%

Source: Van Loo, Hoekens, Verbeke (2017) Food Policy 69
Segment profiles
(n=2,720; 2014; BE, NL, UK, DE)

Involvement with sustainable eating
- Male
- 25-34 yrs
- Low education
- Fulltime employed

Moderately involved, 30.5%
- Male
- 45-54 yrs
- NL
- Single
- Low education
- Unemployed

Health and sustainability involved, 31.6%
- Female
- 55-65 yrs
- DE
- High education

Health involved, 22.5%
- Female
- With young chld.
- NL
- High education
- Not fulltime emplo

Uninvolved, 15.4%
- Male
- 45-54 yrs
- NL
- Single
- Low education
- Unemployed

Source: Van Loo, Hoefkens, Verbeke (2017) Food Policy 69
Increasing levels of:
- Food-related health concerns
- Self-reported healthy eating
- Subjective healthiness of own diet
- Attitude towards and consumption of plant-based diets
Strong perceived match between a healthy and a sustainable diet 

but also ... a stronger association of both concepts with a plant-based rather than an animal-based diet

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Source: Van Loo, Hoefkens, Verbeke (2017) Food Policy
Insects as food


Contents lists available at ScienceDirect
Food Quality and Preference

journal homepage: www.elsevier.com/locate/foodqual

Profiling consumers who are ready to adopt insects as a meat substitute in a Western society

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Food neophobia
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ABSTRACT

This study investigates the readiness of consumers in a Western society, where traditional meat consumption prevails, to adopt insects as a substitute for meat. Using cross-sectional data (n = 368) and binary logistic regression modeling, the study identifies gender, age, familiarity, food neophobia, convenience and environmental food choice motives, as well as meat-related attitudes and future meat consumption intentions as significant predictors. The predicted likelihood of adopting insects as a substitute for meat is 12.8% [95% CI: 6.1–19.4%] for males and 6.3% [95% CI: 2.8–9.9%] for females, other predictor variables held constant at their mean value. People who claim to be familiar with the idea of eating insects have a 2.6 times higher likelihood, and consumers who intend to reduce fresh meat intake are up to 4.5 times more likely to adopt insects. Food neophobia makes the largest contribution to consumers’ readiness to adopt insects: a one-unit increase in the food neophobia score is associated with a 84% decrease in the predicted odds of being ready to adopt insects. A stronger convenience orientation in food choice and a higher interest in the environmental impact of food choice increase the likelihood of adopting insects by 75% and 71% per unit increase in these predictors’ scores, respectively. By contrast, a one-unit stronger belief that meat is nutritious and healthy, and a one-unit higher importance attached to taste for meat lower the predicted odds by 64% and 61%, respectively. This study reveals that the most likely early adopters of insects as a novel and more sustainable protein source in Western societies are younger males with a weak attachment to meat, who are more open to trying novel foods and interested in the environmental impact of their food choice.
Potential determinants of willingness-to-adopt insects as an alternative to meat

- **Socio-demographics:**
  - Gender
  - Age
  - Education level

- **Neophobia:**
  - Food neophobia
  - Food technology neophobia

- **Food-related attitudes:**
  - Interest in health
  - Attention environmental impact
  - Interest in convenience

- **Familiarity with entomophagy**

- **Involvement with meat:**
  - Importance of meat taste
  - Conviction that eating meat is nutritious and healthy

- **Intention to reduce meat consumption in the coming year**

*Source: Verbeke (2015) Food Qual Prefer*
Method

- Data collection December 2013
- n = 368 meat consumers
- 39% men; 61% women
- Age 18-79 years; average age 42 years
- Representative for region (5 provinces of Flanders)
- 24% with daily meat consumption; 67% several-times-a-week
- 17% planned to reduce meat consumption
- 72% had “ever heard” about the eating of insects

Willingness-to-adopt insects

Representative sample of consumers vs. Convenience sample of students

A. Consument n=368, 2013
- 31.3%
- 16.2%
- 15.5%
- 3%

B. Student n=130, 2014
- 27.9%
- 24.8%
- 22.5%
- 11.6%
- 13.2%

50/50 M/F
Age 19-21
Classroom setting
B.Sc. Bio-Science Engineer

Statistical modeling
(%, n=368; 2013; Flanders, Belgium)

Willingness to adopt (WTA) insects is modeled as a probability that is determined by personal characteristics, attitudinal and behavioural variables using binary logistic regression.

\[
y_i = \begin{cases} 
1 & \text{if } z_i > 0 \\
0 & \text{if } z_i \leq 0 
\end{cases}
\]

Logistic regression coefficients and odds ratios indicate the impact of a variable on WTA. Coefficient estimates can be used to calculate probabilities for different profiles of consumers.

Source: Verbeke (2015) Food Qual Prefer
Results
(n=368; 2013; Flanders, Belgium)

Table 3
Coefficient estimates and diagnostics from binary logistic regression explaining consumers’ readiness to adopt insects as a substitute for meat (n = 368).

<table>
<thead>
<tr>
<th>Variable</th>
<th>β</th>
<th>S.E.</th>
<th>Wald</th>
<th>Sig.</th>
<th>Exp (β)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (male)</td>
<td>0.774</td>
<td>0.363</td>
<td>4.553</td>
<td>0.033</td>
<td>2.169</td>
</tr>
<tr>
<td>Age</td>
<td>−0.028</td>
<td>0.012</td>
<td>5.256</td>
<td>0.022</td>
<td>0.973</td>
</tr>
<tr>
<td>Education</td>
<td>0.005</td>
<td>0.421</td>
<td>0.000</td>
<td>0.991</td>
<td>1.005</td>
</tr>
<tr>
<td>Fam</td>
<td>0.957</td>
<td>0.447</td>
<td>4.580</td>
<td>0.032</td>
<td>2.604</td>
</tr>
<tr>
<td>FNS</td>
<td>−1.811</td>
<td>0.361</td>
<td>25.125</td>
<td>&lt;0.001</td>
<td>0.164</td>
</tr>
<tr>
<td>FTNS</td>
<td>−0.788</td>
<td>0.252</td>
<td>9.741</td>
<td>0.002</td>
<td>0.455</td>
</tr>
<tr>
<td>FHealth</td>
<td>0.416</td>
<td>0.239</td>
<td>3.014</td>
<td>0.083</td>
<td>1.515</td>
</tr>
<tr>
<td>FConv</td>
<td>0.557</td>
<td>0.197</td>
<td>7.973</td>
<td>0.005</td>
<td>1.746</td>
</tr>
<tr>
<td>FEnv</td>
<td>0.539</td>
<td>0.198</td>
<td>7.430</td>
<td>0.006</td>
<td>1.714</td>
</tr>
<tr>
<td>MTaste</td>
<td>−0.952</td>
<td>0.293</td>
<td>10.580</td>
<td>0.001</td>
<td>0.386</td>
</tr>
<tr>
<td>MNutr</td>
<td>−1.025</td>
<td>0.264</td>
<td>15.024</td>
<td>&lt;0.001</td>
<td>0.359</td>
</tr>
<tr>
<td>MRed</td>
<td>1.507</td>
<td>0.389</td>
<td>15.022</td>
<td>0.001</td>
<td>4.512</td>
</tr>
<tr>
<td>Constant</td>
<td>7.999</td>
<td>2.362</td>
<td>11.466</td>
<td>&lt;0.001</td>
<td></td>
</tr>
</tbody>
</table>

Source: Verbeke (2015) Food Qual Prefer
Interpretation

The likelihood of adopting insects as an alternative to meat ...

- Is **double** as large among men compared to women
- Decreases with **27% per 10 years** age increase
- Is **4.5** times bigger among people who plan to **reduce meat intake**
- Is **2.6** times bigger among people **who have heard about it**
- Increases with **75% per unit importance attached to convenience**
- ... with **71% per unit importance attached to environ-impact**
- Decreases with **84% per unit on the scale of food neophobia**
- ... with **55% per unit on the scale of food technology neophobia**
- ... with **61-64% per unit importance attached to the taste of meat and conviction that meat is nutritious and healthy**

*Source: Verbeke (2015) Food Qual Prefer* 39
Simulated probability of adopting insects

Male, 30 years, attention to environmental impact of food choice, in search for alternatives to meat

Female, 50 year, meat lover, attached to the taste of meat and convinced about its healthiness

Source: Verbeke (2015) Food Qual Prefer
“Western early adopters” of insects as an alternative to meat are:

Young men with low food neophobia, who pay attention to the environmental impact of their food choice, and plan to reduce their meat consumption.

The probability that this type of consumer is willing to adopt insects amounts more than 90%.

They constituted less than 2% of our study sample

Insects in animal feed: Acceptance and its determinants among farmers, agriculture sector stakeholders and citizens

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Sustainability

ABSTRACT
The use of insects in animal feed is a potential avenue to improve the sustainability of animal diets and meet the growing global demand for livestock products. Yet, little is known about the attitudes towards and willingness-to-accept insect-based animal feed and foods. This study presents findings from cross-sectional data collected in January 2015 from a sample of 415 farmers, agriculture sector stakeholders and citizens in Flanders, Belgium. Attitudes towards the idea of using insects in animal feed were generally favourable, most notably for fish and poultry feed. Two thirds of the study participants were willing-to-accept the use of insects in animal feed. The foods obtained from animals fed on insect-based feed were widely accepted. Farmers were more critical – but still generally positive – as compared to stakeholders and citizens. Insect-based feed was perceived to be more sustainable, to have a better nutritive value, but a lower microbiological safety as compared to conventional feed. In addition, the resulting foods were perceived to be more sustainable, nutritious and healthy, but at the risk of presence of off-flavours and allergens. Perceived benefits of using insects in animal feed pertained mainly to lowering the dependency on protein imports, and better valorisation of organic waste. Benefit perceptions were stronger and outweighed risk perceptions as a determinant of accepting the use of insects in animal feed. However, the strongest determinant of acceptance was a person’s own willingness-to-eat insect-based foods. Overall, the findings of this study indicate a positive atmosphere and momentum for change towards the adoption of insects as a new ingredient in animal feed.

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Method

- Data collection January 2015
- $n = 415$ farmers, agriculture sector stakeholders, citizens
- Including 151 livestock farmers
- 67% men; 33% women
- Average age 37 years
- Recruitment and survey administration during agricultural fair in Flanders, Belgium

Perception of insect-based feed and resulting foods

Insect-based feed and resulting foods seen as:
- more sustainable, nutritious and healthy
- Less microbiologically safe (feed)
- Allergenic, and a harder sell (foods)

Acceptance of the use of insects in animal feed and insect-based food

Perceived challenges facing the use of insects in animal feed

- Perceived market-related challenges dominant over perceived technological challenges
- “Consumer acceptance” seen as the major pitfall despite favourable personal WTA ...

![Bar chart showing perceived challenges](chart.png)

**Source:** Verbeke et al. (2015) Anim. Feed Sci. Tech. 204
Perceived benefits and risks

Top-3 perceived **benefits** (overall score 3.71)

- Lower dependence on foreign protein imports
- Better valorisation of organic waste
- Improved sustainability of livestock production

Top-3 perceived **risks** (overall score 3.04)

- Possible impact on biodiversity
- Introducing microbiological contamination in the food chain
- Competition with other agricultural activities

Cultured meat

‘Would you eat cultured meat?’: Consumers’ reactions and attitude formation in Belgium, Portugal and the United Kingdom

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REVIEW

Challenges and prospects for consumer acceptance of cultured meat

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Abstract

Consumer acceptance of cultured meat is expected to depend on a wide diversity of determinants ranging from technology-related perceptions to product-specific expectations, and including wider contextual factors like media coverage, public involvement, and trust in science, policy and society. This study discusses the case of cultured meat against this multitude of possible determinants shaping future consumer acceptance or rejection. The paper also presents insights from a primary exploratory study performed in April 2013 with consumers from Flanders (Belgium) (n=180). The concept of cultured meat was only known (unaided) by 13% of the study participants. After receiving basic information about what cultured meat is, participants expressed favorable expectations about the concept. Only 9% rejected the idea of trying cultured meat, while two thirds hesitated and about quarter indicated to be willing to try it. The provision of additional information about the environmental benefits of cultured meat compared to traditional meat resulted in 43% of the participants indicating to be willing to try this novel food, while another 51% indicated to be ‘maybe’ willing to do so. Price and sensory expectations emerged as major obstacles. Consumers eating mostly vegetarian meals were less convinced that cultured meat might be healthy, suggesting that vegetarians may not be the ideal primary target group for this novel meat substitute. Although exploratory rather than conclusive, the findings generally underscore doubts among consumers about trying this product when it would become available, and therefore also the challenge for cultured meat to mimic traditional meat in terms of sensory quality at an affordable price in order to become acceptable for future consumers.

Keywords: acceptance, artificial, attitude, consumer, cultured, in vitro, meat, synthetic
Consumer reactions
(Focus group discussions, n=109, and online deliberation, n=70, in Belgium, Portugal and the UK)

Curiosity
Ethical motives
Food security
Not as a nation, as a planet

First exposure
Emotional reactions
Unnaturalness of the process
Playing God – Messing with nature

2. Connecting with benefits and risks
   - Expressing few personal benefits
   - Fearing personal risks
   - Acknowledging societal benefits
   - Worrying about societal consequences

3. Further reflections
   - Uncertainty in scientific knowledge
   - Controllability and regulations
   - Accepting scientific progress

Mutations, Defects
Controls
Unavoidable progress

Consumer awareness and expectations
(n=180, April 2013)

Very low awareness
Surprisingly favourable perception, except on taste and price

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Awareness (%) and expectations about cultured meat (7-point semantic differential scale) and evaluation of in vitro meat as an alternative for traditionally produced meat (1=Totally disagree, 7= Totally agree) (n=180)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness about cultured meat: “Have you heard about in vitro meat?”</td>
<td>%</td>
</tr>
<tr>
<td>Yes, and I know what it means</td>
<td>13.0</td>
</tr>
<tr>
<td>Yes, but I do not know what it means</td>
<td>36.0</td>
</tr>
<tr>
<td>No, I have never heard of in vitro meat</td>
<td>51.0</td>
</tr>
<tr>
<td>Expectations about cultured meat</td>
<td>Mean</td>
</tr>
<tr>
<td>Not healthy (1)—very healthy (7)</td>
<td>3.98</td>
</tr>
<tr>
<td>Not safe (1)—very safe (7)</td>
<td>4.64</td>
</tr>
<tr>
<td>Not nutritious (1)—very nutritious (7)</td>
<td>4.59</td>
</tr>
<tr>
<td>Not ecological (1)—very ecological (7)</td>
<td>4.91</td>
</tr>
<tr>
<td>Not ethical (1)—very ethical (7)</td>
<td>4.73</td>
</tr>
<tr>
<td>Much more expensive (1)—much cheaper than traditional meat (7)</td>
<td>3.31</td>
</tr>
<tr>
<td>Much less tasty (1)—much tastier than traditional meat (7)</td>
<td>3.38</td>
</tr>
<tr>
<td>Much less sustainable (1)—much more sustainable than traditional meat (7)</td>
<td>5.12</td>
</tr>
<tr>
<td>“I believe in vitro meat as a substitute for traditional meat is …”</td>
<td>Mean</td>
</tr>
<tr>
<td>Good</td>
<td>4.61</td>
</tr>
<tr>
<td>Feasible</td>
<td>4.35</td>
</tr>
<tr>
<td>Acceptable</td>
<td>4.58</td>
</tr>
<tr>
<td>Effective</td>
<td>4.53</td>
</tr>
<tr>
<td>A long term solution</td>
<td>4.84</td>
</tr>
</tbody>
</table>

Willingness to accept

Importance of the story told

Table 3 Frequency (% , n=180) of participants claiming to be ‘not’, ‘maybe’ and ‘surely’ willing to try, purchase and pay a price premium for cultured meat

<table>
<thead>
<tr>
<th></th>
<th>Basic information about technology</th>
<th>Additional information about benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not</td>
<td>Maybe</td>
</tr>
<tr>
<td>Willing to try</td>
<td>9.4</td>
<td>66.7</td>
</tr>
<tr>
<td>Willing to purchase</td>
<td>11.7</td>
<td>68.9</td>
</tr>
<tr>
<td>Willing to pay more</td>
<td>42.2</td>
<td>43.9</td>
</tr>
</tbody>
</table>

1) Basic information: “In vitro meat, which is also called ‘cultured meat’, is meat produced in a laboratory using stem cells from an animal and a suitable growth medium. This way, it may be possible to cultivate basically one million ton of meat muscle tissue by using stem cells from one animal. This could be an alternative to traditional meat as we know it nowadays. The product should not be confused with meat substitutes like tofu or quorn because it is real meat, only it has not been obtained as part of a living animal.” This basic information was combined with the visual flowchart “How it works” based on Daily Mail (2012).

2) Additional information: “Currently about one-third of Earth’s land area is agricultural land. About two-thirds of this agricultural land is used for cultivating livestock, which is responsible for about 18% of the greenhouse gas (GHG) emissions. This is more than the transportation sector. The environmental problems associated with livestock production could partially be reduced by no longer producing meat in the traditional way but instead produce meat in vitro. This could lead to a 96% reduction of GHG emissions compared to traditional meat. By culturing meat in a lab, one could also prevent diseases such as mad cow disease and microbiological infections, such as Salmonella. Also the fat composition of the meat can be improved, for example by enriching the meat with omega-3 fatty acids.” Note that this information message explicitly points at the environmental burden of traditional livestock production, while it is univocally positive about culturing meat and stressing possible benefits only.

• Data collection **December 2013**, Flanders, Belgium
• n = 404
• 5% vegetarians
• 39% men; 61% women
• Age 18-79 years; average age 42 years
• Representative for age and region (5 provinces of Flanders)
• 24% with daily meat consumption; 67% several-times-a-week
• 17% planned to reduce meat consumption
Public awareness

Awareness **overall**, and depending on exposure to [in-vitro, synthetic, or cultured] meat, n=404

- **In-vitro**
  - Yes, and know what it is: 23,3%
  - Yes, but don't really know: 17,3%
  - No, never heard of: 59,4%

- **Synthetic**
  - Yes, and know what it is: 28,7%
  - Yes, but don't really know: 14,7%
  - No, never heard of: 56,6%

- **Cultured**
  - Yes, and know what it is: 27,4%
  - Yes, but don't really know: 28,1%
  - No, never heard of: 44,5%

Legend:
- Yes, and know what it is
- Yes, but don't really know
- No, never heard of
To what extent do you believe cultured meat will be..., n=404

- Sustainable: 11.4% not sustainable, 12.9% not sustainable, 34.7% sustainable, 27.7% sustainable, 13.3% sustainable
- Nutritious: 7.9% not nutritious, 14.4% not nutritious, 46% nutritious, 22.8% nutritious, 8.9% nutritious
- Ethical: 17.8% not ethical, 19.3% not ethical, 33.2% ethical, 18.8% ethical, 10.9% ethical
- Safe: 12.1% not safe, 17.6% not safe, 48.3% safe, 16.1% safe, 5.9% safe
- Healthy: 18.1% not healthy, 26% not healthy, 42.3% healthy, 9.9% healthy, 3.7% healthy
- Real meat: 30.7% not real meat, 31.4% not real meat, 21.5% real meat, 11.6% real meat, 4.8% real meat
- Cheap: 34.9% expensive, 30.4% expensive, 27.7% cheap, 8.7% cheap, 3.3% cheap
- Natural: 49% not natural, 27.2% not natural, 17.3% natural, 4.2% natural, 2% natural
Willingness-to-accept

I would be willing to eat cultured meat as an alternative to conventional meat, n=404

- Not at all: 25%
- Rather not: 29.5%
- Neutral: 23.8%
- Rather yes: 17.6%
- Definitely yes: 4.2%
Motives

Why one would consider to eat cultured meat, n=404

- **It causes less animal suffering**
  - Not at all: 8.4%
  - Rather not: 7.7%
  - Neither nor: 20.5%
  - Rather yes: 35.4%
  - Definitely yes: 28%

- **Is a solution for feeding the world**
  - Not at all: 11.4%
  - Rather not: 11.1%
  - Neither nor: 20.3%
  - Rather yes: 34.7%
  - Definitely yes: 22.5%

- **Is better for the environment**
  - Not at all: 8.8%
  - Rather not: 8.9%
  - Neither nor: 30%
  - Rather yes: 32.2%
  - Definitely yes: 20.1%

- **Out of curiosity**
  - Not at all: 16.1%
  - Rather not: 13.9%
  - Neither nor: 21%
  - Rather yes: 30.7%
  - Definitely yes: 18.3%

- **It is healthier**
  - Not at all: 18.3%
  - Rather not: 21%
  - Neither nor: 41.3%
  - Rather yes: 15.8%
  - Definitely yes: 3.6%
Barriers

Why [one] would not consider to eat cultured meat, n=404

<table>
<thead>
<tr>
<th>Reason</th>
<th>Not at all</th>
<th>Rather not</th>
<th>Neither nor</th>
<th>Rather yes</th>
<th>Definitely yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is not natural</td>
<td>2.7%</td>
<td>8.2%</td>
<td>23.5%</td>
<td>45.8%</td>
<td>19.8%</td>
</tr>
<tr>
<td>I do not consider it real meat</td>
<td>4.5%</td>
<td>12.1%</td>
<td>25%</td>
<td>39.9%</td>
<td>18.5%</td>
</tr>
<tr>
<td>I do not trust it</td>
<td>4.5%</td>
<td>11.6%</td>
<td>32.4%</td>
<td>35.9%</td>
<td>15.6%</td>
</tr>
<tr>
<td>I do not perceive a need for it</td>
<td>8.7%</td>
<td>30.2%</td>
<td>29.7%</td>
<td>21%</td>
<td>10.4%</td>
</tr>
<tr>
<td>Technology is not ethically acceptable</td>
<td>9.2%</td>
<td>24.8%</td>
<td>39.6%</td>
<td>18.8%</td>
<td>7.6%</td>
</tr>
</tbody>
</table>
Conclusions

- Ever increasing consumer expectations about food
- Important areas of change in consumer behavior
- Multitude of potential issues of concern related to food
- “Meat” more than average involved and affected

- Perceived match health-sustainability, in favour of plant-based
- Insects as food: hype is largely over; may return some time
- Insects as feed: great potential, esp. seafood and poultry
- Cultured meat: strong promises still to be substantiated
- Others: algae, microalgae, Rubisco, microbial protein, ...
Consumer food choice behavior: underlying preferences, motivations and attitudes

with a focus on alternative proteins

THANKS FOR YOUR ATTENTION

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