Food security and novel food solutions: implications for food choice, safety, and waste: facilitating informed decision making re risks of nanotechnology in food products

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ESRC Funded Seminar Series on Food Options, Opinions and Decisions (FOOD): Integrating perspectives on consumer perceptions of food safety, nutrition and waste
IMPLICATIONS OF INTRODUCING NEW FOOD PRODUCTS

Introducing new food products requires informing consumers about their risks and benefits

- Legal obligation: citizens have a right to be informed about the risks to which they are exposed
  - there is no such thing as “no risk”
    - e.g. ‘synthetic amorf silica’ (SAS), E551; based on nanotechnology; used in coffee creamer, soups, sauce, herbs mixtures etc.
  - otherwise threat of law suits
Introducing new food products requires informing consumers

- Strategy in reputation management & avoidance of loss of trust in case of (future) incidents

- Strategy in achieving particular health-related aims with consumers
  - Persuasive communication
  - Facilitation of consumer sense making and consumer informed decision making
## APPROACHES IN RISK COMMUNICATION

<table>
<thead>
<tr>
<th>Activity of risk communicator</th>
<th>Communication aim</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Top-down</strong></td>
<td><strong>Persuasion and behaviour change</strong></td>
</tr>
<tr>
<td>Tell consumers what to do</td>
<td></td>
</tr>
<tr>
<td>&lt; 2000</td>
<td></td>
</tr>
<tr>
<td><strong>Bottom-up</strong></td>
<td><strong>Facilitate consumer informed decision making</strong></td>
</tr>
<tr>
<td>Provide answers to consumer question</td>
<td></td>
</tr>
<tr>
<td>2000 →</td>
<td></td>
</tr>
<tr>
<td><strong>Interaction</strong></td>
<td><strong>Facilitate consumer informed decision making + facilitate consumer interaction</strong></td>
</tr>
<tr>
<td>Provide answers + Information exchange via social media</td>
<td></td>
</tr>
<tr>
<td>2010 →</td>
<td></td>
</tr>
</tbody>
</table>
FOCUS

What is the significance of social media in facilitating informed decision making in relation to new food products?

- What sources do consumers use for food information?
- Do consumers use social media to find food information?
- How do consumers respond to online interaction with a food communicator?
- Are consumers influenced by food related opinions on social media?
STUDY 1 – SURVEY ON MEDIA USE

Perception of media channels and likelihood of use in food related context

Fictitious scenario:
  - Vegetables have risks and benefits
  - Contaminated vegetables found in supermarkets → removed and destroyed.
  - Newly imported vegetables tested.
  - Opinion of National Food Safety Authority and consumer organisations on safety of vegetables
LIKELIHOOD OF USING INFORMATION CHANNELS

1 < x < 7

Search engine: 5.40
Television: 5.11
Newspaper: 5.06
Radio: 4.98
Website Communicator: 4.93
Conversations: 4.93
Social media: 3.45

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STUDY 2 – OBSERVATION OF WEB-BROWSING BEHAVIOUR

What online sources do consumers use?
- Tracking information seeking behaviour in web-browsing
- Cue:
  - What benefits of organically produced foods are mentioned on the internet?
  - What risks of organically produced foods are mentioned on the internet?
- Tool that registered browsing behaviour
- All explored links classified and duration of visit calculated (approximately n=1900)
<table>
<thead>
<tr>
<th>Source</th>
<th>Benefits</th>
<th></th>
<th></th>
<th>Risks</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>%</td>
<td>Dwell time</td>
<td>Number</td>
<td>%</td>
<td>Dwell time</td>
</tr>
<tr>
<td>User generated info</td>
<td>32</td>
<td>9%</td>
<td>39.3</td>
<td>164</td>
<td>42%</td>
<td>36.1</td>
</tr>
<tr>
<td>Dutch Nutrition Centre</td>
<td>85</td>
<td>24%</td>
<td>128.6</td>
<td>36</td>
<td>9%</td>
<td>68.7</td>
</tr>
<tr>
<td>Health &amp; environment</td>
<td>48</td>
<td>14%</td>
<td>63.8</td>
<td>67</td>
<td>17%</td>
<td>40.6</td>
</tr>
<tr>
<td>News media</td>
<td>43</td>
<td>12%</td>
<td>29.6</td>
<td>44</td>
<td>11%</td>
<td>34.9</td>
</tr>
<tr>
<td>Food producers</td>
<td>58</td>
<td>16%</td>
<td>16.2</td>
<td>10</td>
<td>3%</td>
<td>25.9</td>
</tr>
<tr>
<td>Encyclopaedias</td>
<td>44</td>
<td>12%</td>
<td>88.5</td>
<td>6</td>
<td>2%</td>
<td>33.5</td>
</tr>
<tr>
<td>Portals</td>
<td>18</td>
<td>5%</td>
<td>45.2</td>
<td>14</td>
<td>4%</td>
<td>29.6</td>
</tr>
<tr>
<td>Retail organisations</td>
<td>4</td>
<td>1%</td>
<td>90.5</td>
<td>9</td>
<td>2%</td>
<td>44.3</td>
</tr>
<tr>
<td>Authorities</td>
<td>2</td>
<td>1%</td>
<td>91.5</td>
<td>5</td>
<td>1%</td>
<td>18.8</td>
</tr>
<tr>
<td>Consumer org.</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0</td>
<td>0%</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>19</td>
<td>5%</td>
<td>46.1</td>
<td>33</td>
<td>9%</td>
<td>23.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>353</td>
<td>100%</td>
<td><strong>388</strong></td>
<td>100%</td>
<td><strong>388</strong></td>
<td>100%</td>
</tr>
</tbody>
</table>
PREFERENCE FOR SOURCES

- Food producers: 3.29
- Governmental authority: 4.48
- Consumer organisation: 4.81
- Online newspaper: 3.55
- Online encyclopedia: 4.52
- Social media: 3.10

1 < x < 7

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RESEARCH ON COMMUNICATION EFFECTS

- Long tradition of research into effects of communication campaigns and mass media coverage

- Effect dependent on 5 W’s characteristics of
  - who source, communicator
  - says what message (content, tone-of voice, format)
  - to whom receiver, audience
  - where channel
  - when context, timing

and the particular food issue at hand
EFFECT STUDIES

How about communication via social media re risks of new foods?

- intended versus unintended effects

2 studies

- Effects of online chat on nanotechnology in food
  - Intended – focus on communicator and message
- Effects of discourse on nanotechnology on Facebook
  - Unintended effects – focus on message and receiver characteristics
STUDY 3 – EFFECT ONLINE CHATTING

Intended – focus on source and message
- 3 x 3 Factorial design
  - Communicator: expert – similar other – not specified
  - Expressed viewpoint: positive – undecided – negative

Processes:
- Authority principle
- Similarity principle
DESIGN

3 x 3 Factorial design ; n=270

<table>
<thead>
<tr>
<th>Alleged chat partner</th>
<th>Expressed viewpoint</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Negative</td>
</tr>
<tr>
<td>Expert Dutch Nutrition Centre</td>
<td></td>
</tr>
<tr>
<td>Similar other</td>
<td></td>
</tr>
<tr>
<td>Not specified</td>
<td></td>
</tr>
</tbody>
</table>
I think that there are more advantages to nano in food products than disadvantages. It’s supposed to lead to better products that are tasty yet healthy. Oh yes, and even additives that can put vitamins or medicines in foods etc. Even though it could be that nanoparticles get into your blood and destroy your DNA or gather themselves in your cells. Still, I believe we shouldn’t worry about this. The advantages are crucial!

What do you think?

... ... ... ... ... ...

Please wait, partner is typing ....
DEPENDENT VARIABLES

Perception and attitude
- Risk perception
- Attitude

Dealing with information
- Information need
- Taking notice of information
- Seeking information
- Sharing information
EFFECT OF EXPRESSED VIEWPOINT IN CHAT ON ATTITUDE

Mean item score

Risk perception (ns)

Attitude (p<.01; $\eta^2=.05$)

<table>
<thead>
<tr>
<th>Mean item score</th>
<th>Negative</th>
<th>Undecided</th>
<th>Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk perception (ns)</td>
<td>4.78</td>
<td>5.11</td>
<td>4.67</td>
</tr>
<tr>
<td>Attitude (p&lt;.01; $\eta^2=.05$)</td>
<td>2.76</td>
<td>3.23</td>
<td>3.39</td>
</tr>
</tbody>
</table>

- $\eta^2 = .05$
- Risk perception (ns)
- Attitude (p<.01; $\eta^2=.05$)
EFFECT OF PERCEIVED EXPERTISE ON INFO-VARIABLES

<table>
<thead>
<tr>
<th>Dependent variables</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
</tr>
<tr>
<td>Information need</td>
<td>.18</td>
</tr>
<tr>
<td>Taking notice of info</td>
<td>12.25</td>
</tr>
<tr>
<td>Seeking info</td>
<td>8.64</td>
</tr>
<tr>
<td>Sharing info</td>
<td>9.81</td>
</tr>
</tbody>
</table>

The higher the perceived expertise of the chat partner, the more response.
INTERACTION EFFECT PERCEIVED EXPERTISE – SHARING

\[ \eta^2 = .03 \]
SUMMARIZING

Attitudes

- Online interactions with consumers in which *viewpoints* are expressed might affect consumer attitudes in the direction of the viewpoint
- The *identity* of the chat partner not relevant

Dealing with information

- *Perceived expertise* of chat partner important determinant of dealing with information
- If partner perceived to have expertise, consumers more inclined to share clear viewpoints
- Expressed viewpoint not relevant in information seeking and sharing
STUDY 4 – EFFECTS ON READING FACEBOOK POSTS

- Effects of discourse on nanotechnology on Facebook
  - Unintended effects – focus on message and receiver characteristics

- One factor design, 3 conditions:
  - Facebook post inviting comments +
    - 4 positive comments
    - 2 positive comments + 2 negative comments
    - 4 negative comments
  - Comments by “unfamiliar others”

- Initial dread as moderator
POST + 4 POSITIVE COMMENTS

Marieke Kleinsma
What do you think about the application of nanotechnology in foods?
Like · Comment · 29 May at 13.02

Linda van der Velde I saw once on TV how we can use nanotechnology and I am happy about the application of nanotechnology in foods! 😊
29 May at 13.18 · Like · 273

Thomas Kuiper I think people get ill less often because of the nanotechnology in foods; therefore it is safe!
29 May at 13.21 · Like · 254

Kevin Otters I am very much convinced that nanotechnology in foods makes food products healthier
29 May at 13.46 · Like · 286

Lydia Steinen To the best of my knowledge, nanotechnology in food products is not harmful and I will just eat it!!
29 May at 14.03 · Like · 252
EVALUATION OF THE FACEBOOK SCREENSHOT

- Clear: 4.91
- Emotional: 4.21
- Helpful in advice: 3.40
- Biased: 4.48

1 < x < 7
DEPENDING VARIABLES

Perceptions and attitude
- Risk perception
- Benefit perception

Emotions
- Anxiety
- Positive emotions

Attitudes and behavioural intentions
- Trust in retail
- Attitude re nano in food
- Willingness to buy
**SIGNIFICANT MAIN EFFECTS FOR 3 OUT OF 7 VARIABLES**

<table>
<thead>
<tr>
<th>Risk perception</th>
<th>Benefit perception</th>
<th>Attitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.4</td>
<td>4.1</td>
<td>3.5</td>
</tr>
<tr>
<td>4.0</td>
<td>3.6</td>
<td>3.9</td>
</tr>
<tr>
<td>3.3</td>
<td>3.6</td>
<td>3.9</td>
</tr>
</tbody>
</table>

- **Risk perception**
  - Negative
  - Mixed
  - Positive

- **Benefit perception**
  - Negative
  - Mixed
  - Positive

- **Attitude**
  - Negative
  - Mixed
  - Positive
IMPLICATIONS RE INFORMED DECISION MAKING

Facilitation of informed decision making

- Evidence that risk information on social media networking sites (Facebook) impacts risk perception, benefit perception and attitudes
- Evidence that (Dutch) consumers end up on social media sites when seeking information
- As authorities have no control over this information, it might be wise to provide risk information on new food products on social media
  - provide own perspective
  - reach out to hard to reach target groups
  - build trust
  - facilitate interaction among consumers
IMPLICATIONS RE RISK MODELS

How can we better include the interactive perspective in risk models?

Theoretical models often focus on the individual

- Some issues reflect a problematic family attitude or group behaviour
  - Obesity, waste?
- Informed decision making is also a collaborative effort
- Interventions at the individual level may impact family life
  - Family dinners collide with diet drinks as dinner
- “Social norm” insufficiently reflects these processes

Need for decision making models and interventions at the household or group level?
THANK YOU!