Assessing risk and benefit perception-Implications for communication

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Overview

- Differences in expert and lay perceptions of effective risk management
- What determines good food risk management?
- The need for risk-benefit analysis?
- Risks, benefits and agrifood technologies
  - Genetic modification
  - Nanotechnology
- Other food issues associated with both risks and benefits
- Lay perspectives on integrated risk-benefit communication
- Conclusions
  - Emerging issues in risk-benefit perception and communication

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Differences in expert and lay perceptions of effective risk management

A continuing trend

Focus Groups: consumers and experts

- **Consumers & Experts**
  - N=108; Denmark, Greece, Germany, UK, Slovenia
  - *Consumers: perceptions of how well risks were managed & trustworthiness of different actors*
  - *Experts: extent they agreed with consumer statements related to food risk management concerns*

- **Follow-up Telephone Interviews**
  - N=71; Denmark, Greece, Germany, UK, Slovenia
  - *Consumers were presented with expert statements on food risk management and experts were asked to respond to several consumer statements*

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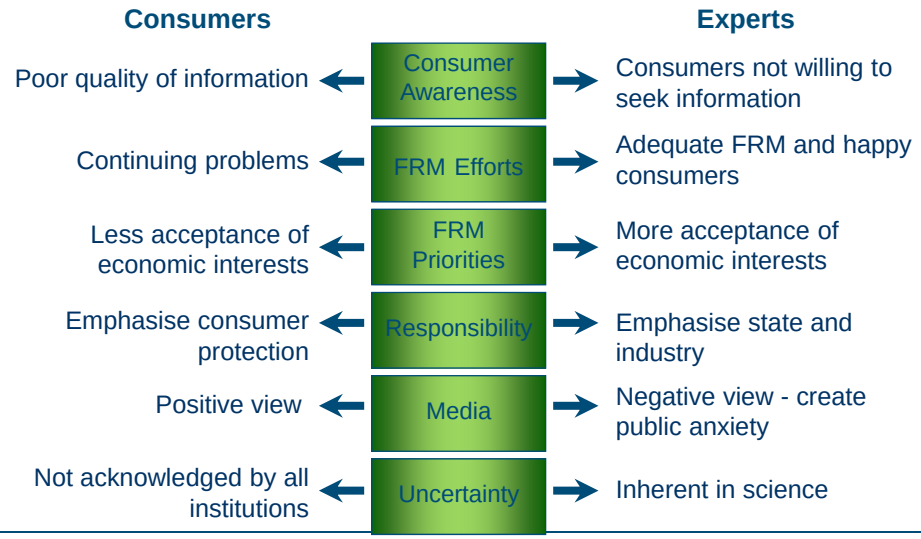
Consumers & Experts: A Perceptual Divide

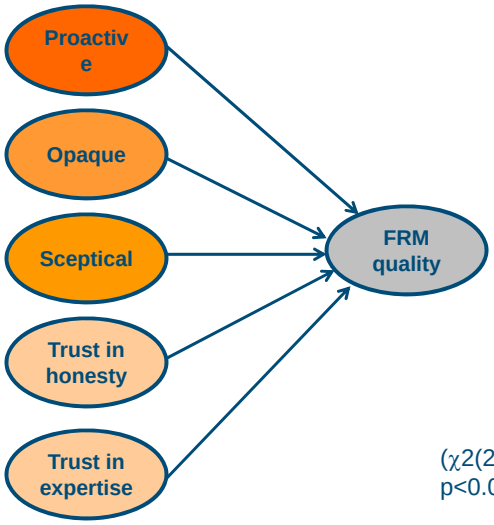


What determines good food risk management?

The constructs (derived from lay-expert focus groups)

- Proactive consumer protection
- Opaque and reactive risk management
- Scepticism regarding risk assessment and risk communication practices
- Trust in expertise of food risk managers
- Trust in honesty of food risk managers

Structural model – FRM quality



(χ2(2420)=8429, p<0.01; RMSEA=0.07).

Case Studies: Overview

Semi-structured interviews

Cases (N=206)	*"Crisis" incident*	*Low impact incident*
Germany	BSE	Nematodes in fish
Norway	E.coli	Salmon
UK	BSE	Salmon
Greece	Avian influenza	Yogurt/ Honey

Case studies – conclusions

- Preventative risk management measures important
- Transparency in risk analysis
- Communication of uncertainty and variability
- Expertise is essential component of effective risk management
- Emphasis on rapid responses to contain food safety incidents if they occur
- Communication of actions taken to improve future consumer protection (institutional learning and preparedness)

Customise messages to include information on:

- Consumer preferences
- Cultural environments
- Experiences with previous incidents
- Past performance of local institutions

Examine whether an ***isolated number of approaches*** can be identified to coordinate risk communication across different countries

The need for risk-benefit analysis?

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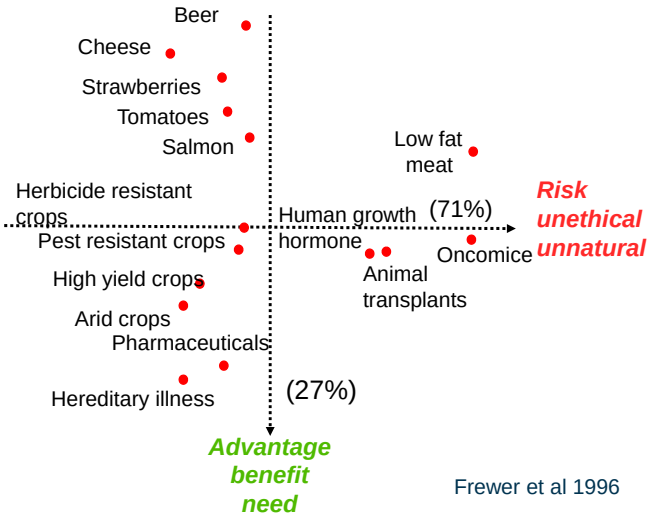
"Soil Association bans nanomaterials from organic products2 (Guardian January 2008)

Anti-nanotechnology protesters, Chicago

Protest against Minatec, Grenoble, France

Consumer Perceptions of Specific Applications of Genetic Modification



Frewer et al 1996

Information experiments- Independent variables

- Hazard type **(Mycotoxins, GM potato, Pesticide Residues)**
- Proactive risk management implemented **(Yes/No)**
- Regulatory enforcement **(Yes/No)**
- Uncertainty acknowledged **(Yes/ No)**
- Population level variability acknowledged **(Yes/No)**

Van Dijk et al. appetite, 2008

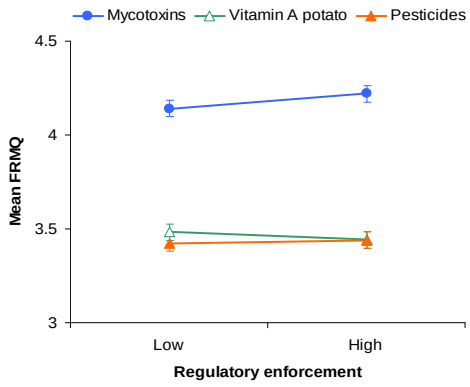
Information experiments: experimental design

- Representative sample of consumers (gender, age and educational level)
  - Germany (n=1,796)
  - Greece (n=1,604)
  - Norway (n=2,273)
  - United Kingdom (n=2,279)

Hazard type

- NATURAL RISK
  - Mycotoxins
- TECHNOLOGICAL RISK-BENEFIT
  - GM potato
- TECHNOLOGICAL RISK
  - Pesticide Residues

Impact of information about regulatory enforcement on risk management efficacy by hazard type:



- Mycotoxins perceived as a Natural rather than artificial hazard?

F(2,22146)=3.84, p=.022

Van Dijk et al, in press, Appetite

Conclusions

- People trust regulators to manage natural hazards more than technological hazards
- Independent of whether a benefit is associated with the technology application

Nanotechnology technologies in the agrifood sector

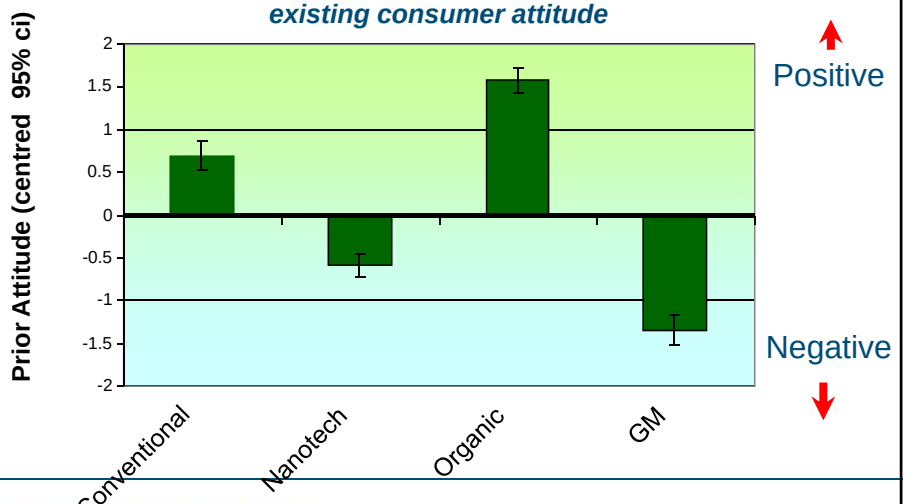
Application	Benefit	Risk	Cost	Uncertainty
Foods which have the potential for cognitive enhancement	Improved cognitive performance	Overuse /misuse of substances Nanoparticles in human body	Financial (who can afford to be enhanced?) Creation of socially excluded individuals	Unintended effects? Population level variability?
Nano-enbled microsensors in animals	Real-time monitoring of health status through ICT application	Animal welfare issues(?)	Disadvantaged groups of farmers (e.g. in developing countries)	Effects on human health through ingestion (?)
Nanoscale genetics	Improved food production	Negative consumer attitudes	Research and development if consumer acceptance does not occur	Environmental and health risk benefit assessment adequate?

The role of attitudes in technology acceptance

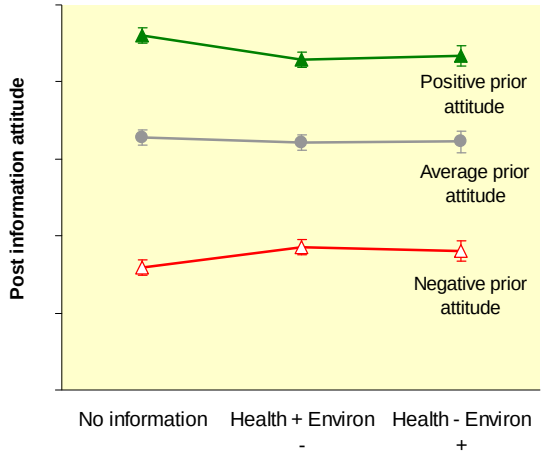
- Attitudes are important for behavioural decision making.
- Attitudes are based on existing (prior) attitudes and new information/experiences.
- In reality, many situations have both positive and negative aspects.

Risk-Experiment: Prior Attitudes

Four technologies selected based on
existing consumer attitude



Aggregated attitude data for the different technologies –effects of "balanced" risk benefit information



Van Dijk et al, in preparation

HLM F (2, 679) = 5.61, p < 0.05.

Results

- *Attitude depolarisation* after balanced information provision
- People with positive prior attitudes became less positive.
- People with negative prior attitudes became less negative.

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Food issues associated with both risks and benefits

Food issue	Risk issue	Benefit issue	Remarks
Fish consumption	Contaminants **methyl mercury.**	Healthy compounds **Omega three fatty acids.**	Differential **variability of population vulnerabilities to risks** (e.g. pregnant women) and **benefits** (for example, people with specific genetic vulnerabilities to cardiovascular disease)
Phytosterol consumption / functional foods	**Inappropriate levels** of consumption (dose consumed is ineffective) **Vitamin depletion.**	Prevention of **cardiovascular diseases**.	Differential **variability of population vulnerabilities to risks** (e.g. pregnant women) and **benefits** (for example, people with specific genetic vulnerabilities to cardiovascular disease)
Botanical food supplements	**Contaminants and residues** (e.g. heavy metals, pesticides), adulteration.	Traditionally-recognised benefits Limited **experimental data**.	**Increased marketing and consumption** - imports of materials used as traditional medicines in countries such as India and China.
Pesticides	Limited understanding of **combined effects** of multiple pesticides	Reduced exposure to **mycotoxins affordable, good quality food.**	Pesticides in foods perceived as **high risk** by consumers.

Lay peoples perspective on integrated risk-benefit health measures

- Framing: Losses (e.g. DALY) have greater impact on perceptions than gains (QALY)

  (Kahneman & Tversky, 1979).
- Impact of balanced information higher on risk perception than on benefit perception

  (Fischer & Frewer, in press).
- Do consumers prefer balanced or integrated information?
- Focus groups
  - Iceland,
  - the Netherlands
  - Portugal
  - The UK

  (van Dijk et al., submitted)

Consumer focus groups: different measures for describing the net health impact

	Positive	Negative
Life expectancy	• **Useful for comparing and reaching conclusions** • **Concrete and understandable**	• **Not relevant for younger people** • **Too much emphasis on health** • **No information about quality of life**

Consumer focus groups; Communication of Qalys and Dalys

	Positive	Negative
Quality of life adjusted life year (QALYS) (“gain” framing)	Important and relevant information.	•Terminology is counterintuitive. •Emphasis is on the negative aspects, such as disability and disease. •Complicated, difficult to understand.
Disability adjusted Life year (DALY) (“loss” framing)	•Combination of life expectancy and disability.	•Complicated and confusing. •Takes too much time to understand. •Not useful.

Conclusions - Emerging issues in risk-benefit perception and communication

- Risk – *Benefit* communication
  - uncertainty associated with both risks and benefits
- Targeted communication to vulnerable populations
- Emerging technologies and societal responses
  - nanotechnology in the agrifood sector
- Public health- Communication of integrated risk-benefit measures
  - e.g. Qualys and Dalys

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Thank you!

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