

### Consumer response to new agrifood technologies: the influence of technology features

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### Why new agrifood technologies matter

rising food demand  
limited resources  
climate change  
increasing incomes  
changing lifestyles  
changing eating habits

- We need alternative ways to look at food production and consumption
- New technologies can play a vital role in the transition towards a more sustainable society

**Technology and society have reciprocal relationship**

**they mutually depend on each other**

### Consumer acceptance is crucial

- Agrifood technologies not always received with great eagerness...
- They can be surrounded with controversies,
  - European consumers are quite critical towards GM applied to food (Eurobarometer, 2010)
- unsubstantiated assumptions,
  - "People just don't want any tampering with their food"
- and over-simplified messages
  - Prince Charles calling GM foods "Frankenstein foods".

### Theoretical framework

Source: Ronteltap, van Trijp, Renes & Frewer, Appetite 2007

### Aim of this study

To objectively assess the influence of technology features on consumers' evaluation of new agrifood technologies

### Research approach

### Selected technology features

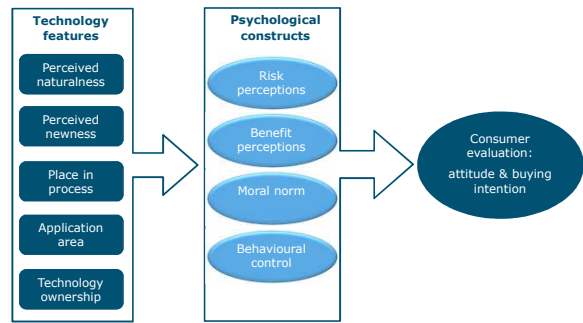
- Naturalness
- Newness



- Application area: food/ non-food
- Place in process: product/ production
- Ownership: one company/ freely available



### Research model



### Consumer study I

- Scenarios based on features: 2\*2\*2 = 8 conditions

|   | Place in process | Application area | Ownership              |
|---|------------------|------------------|------------------------|
| 1 | Production       | Food             | Owned by market leader |
| 2 | Production       | Food             | Freely available       |
| 3 | Production       | Non-food         | Owned by market leader |
| 4 | Production       | Non-food         | Freely available       |
| 5 | Product          | Food             | Owned by market leader |
| 6 | Product          | Food             | Freely available       |
| 7 | Product          | Non-food         | Owned by market leader |
| 8 | Product          | Non-food         | Freely available       |

- Recruited online by market research agency
- N=745, randomly assigned to condition
- Representative sample



### Example scenario fictitious technology

Technology development plays an important role in agriculture. A new technology in the area of agriculture and food is KB6 technology. KB6 technology can reduce the costs of producing vegetables such as tomato, cucumber and sweet pepper. With KB6 technology, each individual plant's needs for nutrients and crop protection can be closely monitored, so that a plant never receives too much or too little of it. It also enables the precise measurement of each individual fruit's ripeness, so that each crop can be harvested at exactly the right moment. The products themselves do not change. It only increases production efficiency, making it possible to reduce these vegetables' price in the shop. KB6 technology is only available to the market leader in tomatoes.



### Results

- Support for overall research model:  $R^2 = .64-.70$
- Perceived naturalness strongest predictor of evaluation
  - $\beta = .45$ ,  $p < .001$  on attitude
  - $\beta = .44$ ,  $p < .001$  on buying intention
- Perceived newness also predicts evaluation
  - $\beta = .18$ ,  $p < .001$  on attitude
  - $\beta = .19$ ,  $p < .001$  on buying intention



### Results

- Technology evaluated more positively when it affects production (vs. product)
  - $F = 8.23$ ;  $p < 0.01$  on attitude
  - No effect on intention
- Technology evaluated more positively when owned by one company (vs. being freely available)
  - $F = 22.63$ ;  $p < 0.001$  on attitude
  - $F = 30.65$ ;  $p < 0.001$  on intention
- No difference between evaluation of application to food vs. non-food on evaluation



## Discussion Study I

- Important for consumers' evaluations
  - Naturalness
  - Newness
- No difference between application to food/non-food
  - Potential explanation: application to food evokes both high risk and high benefit perceptions
- Consumers are more positive about one owner
  - Open answers: more trust in competence and controllability of one big company



## Reality check (Study II)

- What happens if you add context?
- Replicated Study I with existing cases of new agrifood technologies
  - Product: Plant GM
    - Food: potato
    - Non-food: cotton
  - Production: Soilless crop cultivation (SCC)
    - Food: lettuce
    - Non-food: flowers

THE REAL WORLD



## Reality check (Study II)

- Scenarios based on features

|    | Place in process | Application area   | Ownership              |
|----|------------------|--------------------|------------------------|
| 1  | Production (SCC) | Food (lettuce)     | Owned by market leader |
| 2  | Production       | Food               | Freely available       |
| 3  | Production       | Non-food (flowers) | Owned by market leader |
| 4  | Production       | Non-food           | Freely available       |
| 5* | Product (GM)     | Food (potato)      | Owned by market leader |
| 6* | Product          | Food               | Freely available       |
| 7* | Product          | Non-food (cotton)  | Owned by market leader |
| 8* | Product          | Non-food           | Freely available       |

\* Scenarios duplicated without using the term "genetic modification"

- N=440, randomly assigned to condition
- Representative sample



## Results reality check



- Compared to Study I
- Confirmed
  - Support for model ( $R^2 = .54-.65$ )
  - Strong positive effect of naturalness ( $\beta = .49$  on attitude and  $\beta = .45$  on intention,  $p < .001$ )
  - Positive effect of newness ( $\beta = .26$  on attitude and  $\beta = .21$  on intention,  $p < .001$ )
  - More positive evaluation when technology is applied to production (vs. products) ( $F = 22.63$ ;  $p < .001$  for attitude and  $F = 8.83$ ;  $p < .01$  for intention)



## Results reality check

- Different
  - No difference on technology ownership
  - No difference for risk and benefit perceptions on application area
- Effect of using the term GM is limited: only attitude is more positive when GM is not mentioned ( $p < .05$ )



## Conclusions

- Model seems to be useful tool to measure consumer responses to new technologies
  - Robustness needs further testing
- Convincing results: naturalness, newness, and product vs. production are important features for consumers
- Inconclusive results deserve attention
  - Role of technology ownership: multiple connotations?
  - Application to food vs. non-food unclear
  - Other features



Thank you for  
your attention!

