Consumers Attitudes to the EU traceability and labelling regulation.

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Consumers Attitudes to the EU traceability and labelling regulation.

- Outline:
  - Introduction
  - Research objective
  - Literature review and the theoretical model.
  - Research methodology.
  - Measuring consumer preferences: a choice model application.
  - Results and Conclusions.

Introduction

Production side effects

Genetically modified food (GMF).

Demand side effects

- For farmers and manufacturers potential benefits from efficiency improvements are perceived despite some associated costs due to the reimbursement of intellectual property rights.
- GMF can be considered as an opportunity to improve food production technologies and/or product differentiation in the food chain.

- Public controversy has arisen as a result of “uncertainties” and perceived “risks”.
- Human health and environmental concerns, ethical considerations and the role of patents and property rights of multinational corporations.

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Research objective

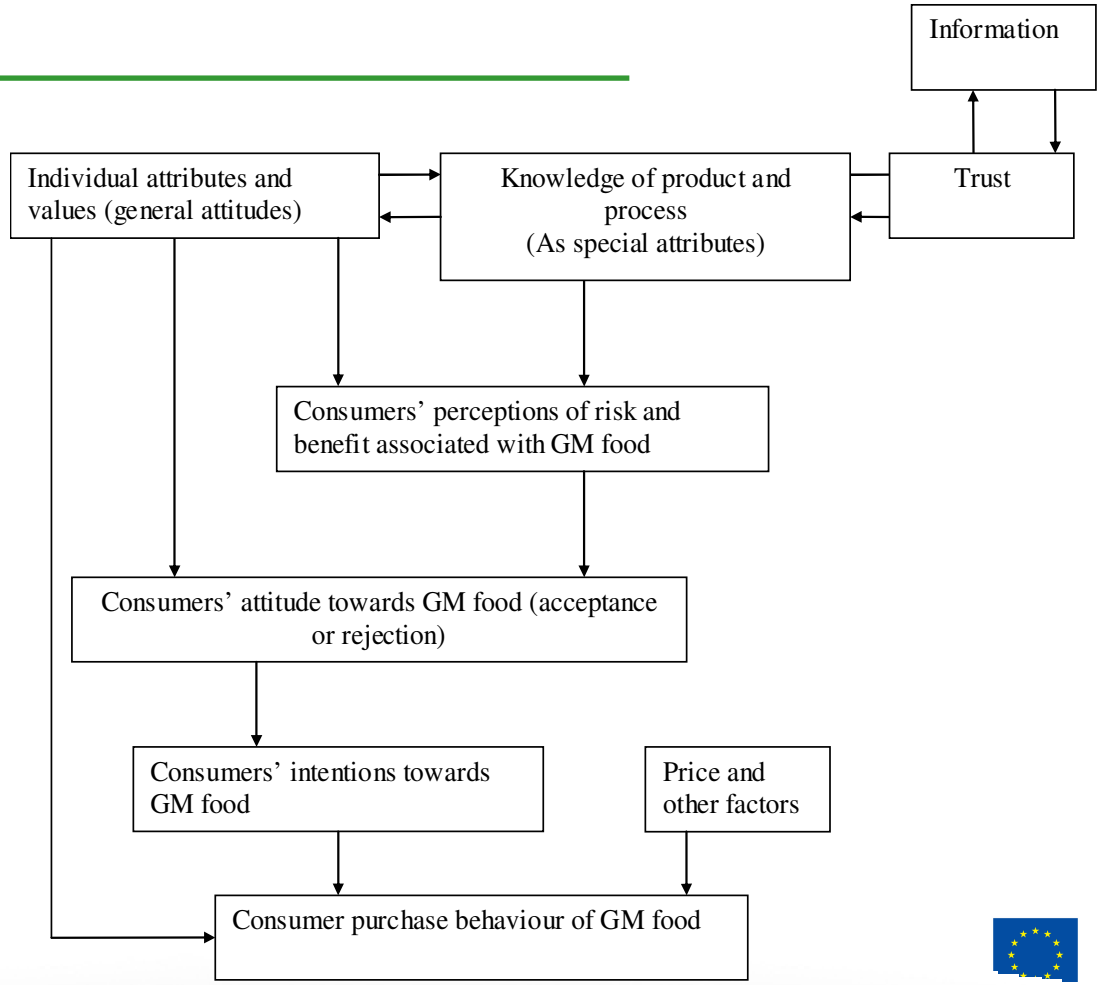
- In order to determine the limits of GMF dissemination and transfer. The main objective of this research is to examine consumers' choice, acceptance and attitudes towards GM food.

Literature Review: The theoretical model of analysis

Attempted to systematically summarise the evidence on the acceptance of GM food and its underlying processes.

- Consumer attitudes towards GMF are driven by three main dimensions:

1. Risks and benefit perceptions associated to GM food. (Socio-economic and demographic attributes).
2. Individual values and attributes.
3. Knowledge. (Trust)



Consumer purchase behaviour can be related to attitudes towards GMF among other factors such as gender, age, or knowledge.

Literature Review: The theoretical model of analysis

- From the literature review, it can be also conclude that:
  - Most consumers relate GM food to a negative impact on their personally utility, and are not wtp for such products.
  - Moreover it was also seen that labelling associated with GM food and the type of genes associated with the modification is very important in food choice. As well as individual-specific characteristics (age, gender…)

Based on this result and on:

- Lancaster consumer theory: goods are selected by consumers, based on their characteristics which are the source of consumers utility. (Lancaster, 1966)
- Random utility theory: Individuals will choose, among a set of alternatives, the good that generates the highest utility. (MacFadden, 1974)

We concluded that choice experiments is the best methodology for analyse consumers intentions towards GM food.

Research Methodology

Choice experiment framework

- A good can always be characterized by its characteristics or attributes.
- Individuals select among alternative options the good that generates the highest utility, where each option is characterised by a number of attributes with different levels.
- Following (Louviere et al., 2000) the probability of an individual q choosing a particular alternative i out of the set of alternatives J can ba calculated as:

$$P_i = \frac{1}{\sum_{j=1}^{J} \exp -(V_i - V_j)}; j = 1,...i,...,J \quad i \neq j$$

- Which lead to use the conditional logit choice or conditional multinomial logit (MNL) model.
- Maximum likelihood is usually used to estimate the population parameters from the observed sample
- Socio-demographic characteristics (SDC) have been included in the analysis by interaction with the attribute levels.

Measuring consumer preferences: a choice model application.

Experimental design

- The survey was administered, by a research market company, during spring 2007 by a face to face questionnaire. A total of 1,614 interviews were carried out in five countries. (Denmark, Germany, Spain; GB and Poland)

Respondents' selection was based on:

- Respondents need to be the household person with the main responsibility for buying food.
- They might buy both cornflakes and tomatoes/rapeseeds - the products used for the choice-modeling experiment.

Characteristic	Levels
Respondents Age	18-25; 26-40; 41-65; more than 65
Gender	Male; Female
Income Level	Five levels, differs among countries.
Studies	Primary school, high school, university studies.
Children in Scholl	Yes, not

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Experimental design

- For the choice-modelling experiment a pilot questionnaire was performed for the selection of product attributes.

Cornflakes		**Tomatoes /Rapeseed oil**	
Attribute	Level	Attribute	Level
Production technology	Conventional, Organic, GM health benefits, GM environmental benefits	Production technology	Conventional, Organic, GM health benefits, GM environmental benefits.
Price (500g)	GB: 0.7, 1.3, 2.00, 2.50 £ DE: 1.00, 2.00, 3.00, 4.00 € DK: 16.00, 30.00, 42.00, 54.00 DK PO: 2.50, 5.00, 6.80, 8.80 PLN ES: 1.00, 2.00, 2.80 , 3.50 €	Price Tomato:1kg Rapeseed: 1l	GB: 0.7, 1.4, 2.00, 2.50 £ DE: 1.25, 2.50, 4.00, 5.00 € DK: 16.00, 32.00, 43.00, 56.00 DK PO: 2.25, 4.50, 6.80, 9.00 PLN ES: 1.00, 2.00, 2.70 , 3.50 €
Product functionality	Normal, less carbohydrates	Origin	Imported, Locally produced

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Experimental design

	Choice	Option 1			Option 2			Option 3		
		A1	A2	A3	A1	A2	A3	A1	A2	A3
Block 1	Choice 1	0	1	1	1	2	0	3	0	0
	Choice 2	2	1	0	3	2	1	1	0	1
	Choice 2	3	0	0	0	1	1	2	3	1
	Choice 4	1	0	1	2	1	0	0	3	0
	Choice 5	2	0	1	3	1	0	1	3	0
	Choice 6	1	2	1	2	3	0	0	1	0
	Choice 7	2	3	0	3	0	1	1	2	1
	Choice 8	2	2	1	3	3	0	1	1	0
Block 2	Choice 9	0	2	0	1	3	1	3	1	1
	Choice 10	0	3	1	1	0	0	3	2	0
	Choice 11	3	3	1	0	0	0	2	2	0
	Choice 12	0	0	0	1	1	1	3	3	1
	Choice 13	1	3	0	2	0	1	0	2	1
	Choice 14	1	1	0	2	2	1	0	0	1
	Choice 15	3	2	0	0	3	1	2	1	1
	Choice 16	3	1	1	0	2	0	2	0	0

- We defined a main effects model by fractional factorial design generation, giving a total of 16 alternatives.
- Each respondent was asked to select between three alternatives within a choice set. 16 choice sets were split on two groups (blocking), therefore, each respondent was asked to complete 8 randomly choices for each product.
- An addition question for each performed choice was introduced in the survey. This was the real intention of buying the selected alternatives elected for each choice set. This question allows us to distinguish among consumers who would prefer not to buy as a fourth alternative.

Measuring consumer preferences: a choice model application.

Statistical Model

$$U_{qi} = \beta_1 price_{qi} + \beta_2 organic_{qi} + \beta_3 GMhb_{qi} + \beta_4 GMeb_{qi} + \beta_5 less\ carb_{qi} + \varepsilon_{qi}$$

$$U_{qi} = \beta_1 price_{qi} + \beta_2 organic_{qi} + \beta_3 GMhb_{qi} + \beta_4 GMeb_{qi} + \beta_5 locally\ produced_{qi} + \varepsilon_{qi}$$

The monetary value WTP, was computed as the premium shift from level (i) to level (j) of attribute (A).

$$x = \frac{\beta_{Ai} - \beta_{Aj}}{\beta_p}$$

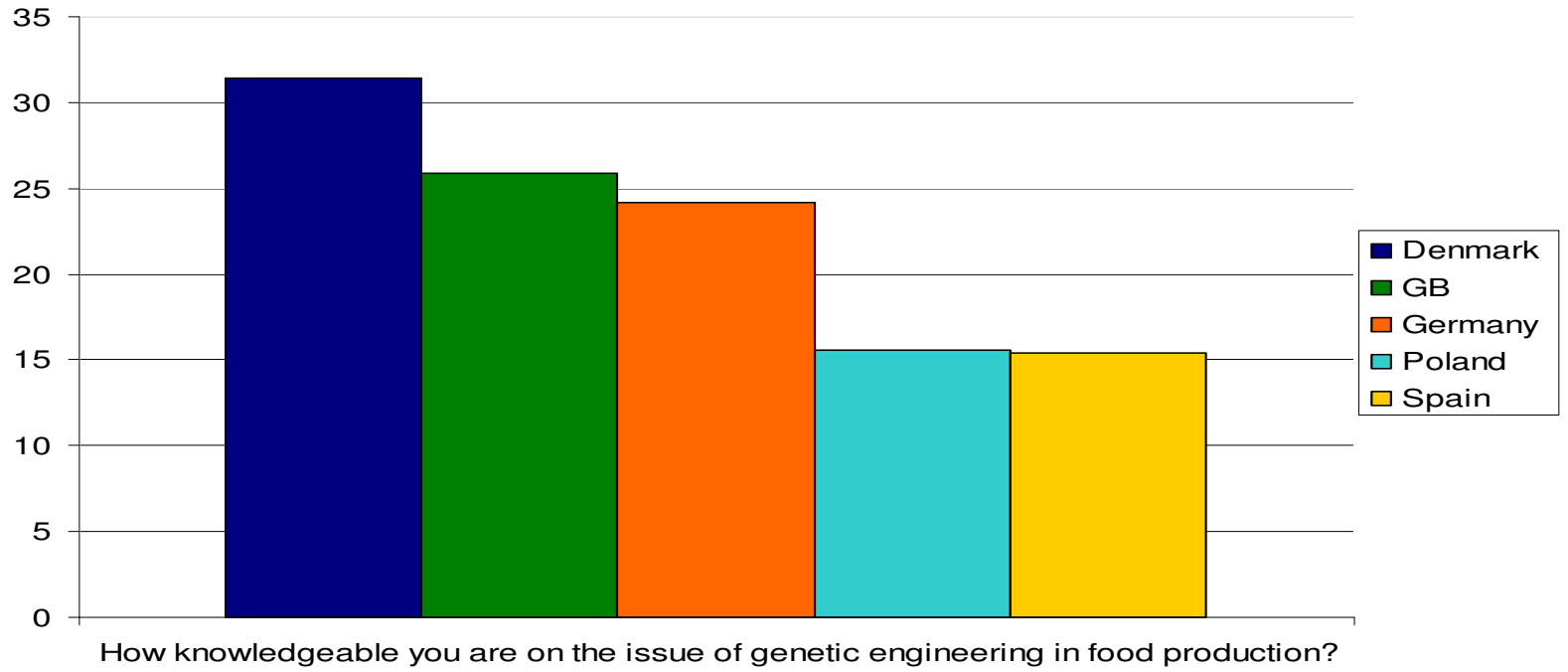
The WTP for the hybrid model has been calculated as:

$$x = \frac{(\beta_{Ai} + \alpha_{Ai} * S_1 + \ldots + \alpha_{Ai} * S_n) - (\beta_{Aj} + \alpha_{Aj} * S_1 + \ldots + \alpha_{Aj} * S_n)}{(\beta_p + \alpha_P * S_1 + \ldots + \alpha_p * S_n)}$$

Measuring consumer preferences: a choice model application.

Descriptive results:

✓Consumers in Denmark and, to a lesser extent, in GB and Germany rated themselves as more well informed on GM issues compared with those in the other two countries.



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Descriptive results:

- ✓ Regarding consumers' sources of reliable information on genetic engineering in food production. Overall, **university scientists and consumer groups** together were the most trusted. However, consumers in **GB, Poland and Spain** tended to trust the **EU** and their own **national governments** to provide reliable information on GM foods and those in **Denmark and Germany** preferred **consumer and environmental groups**.

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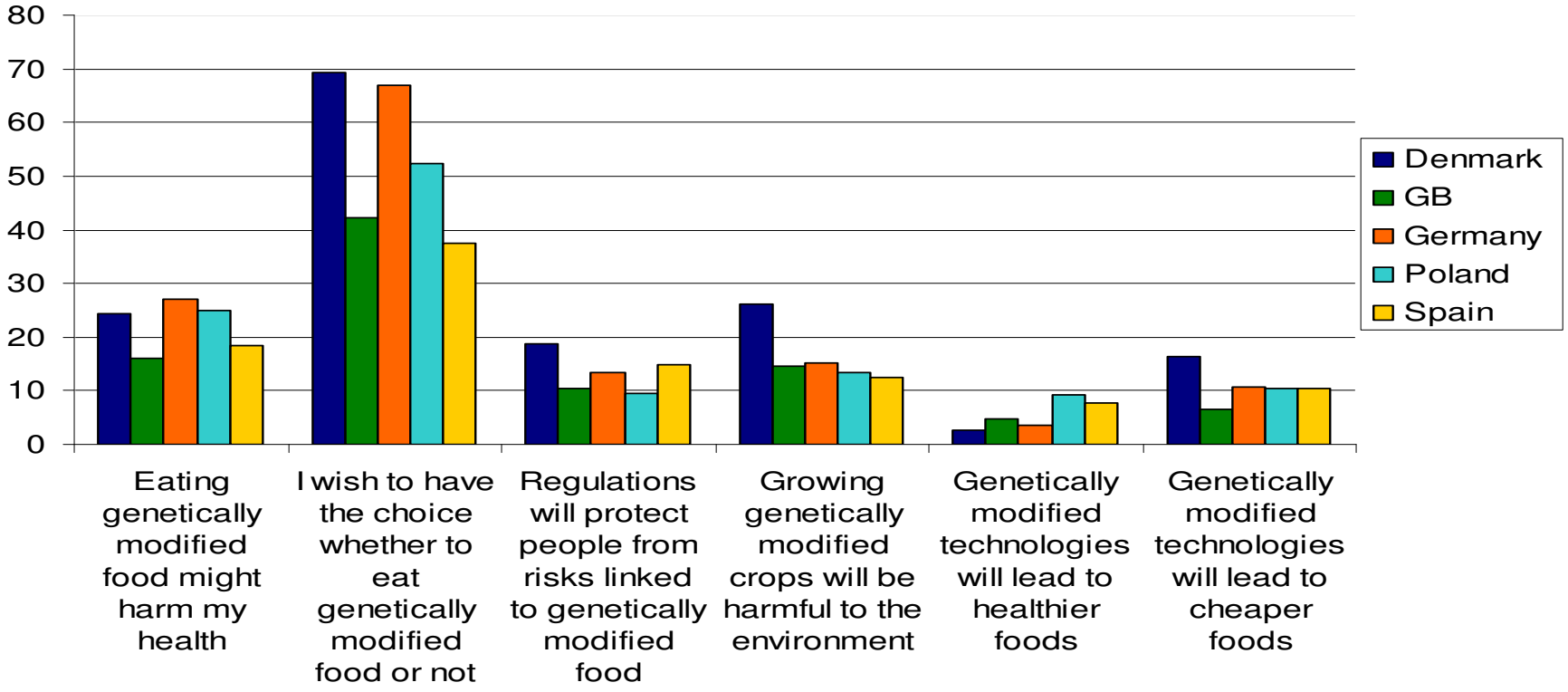
Descriptive results:

✓To try to measure attitudes to GM technology, respondents were given a number of statements expressing a range of views on the GM issue. (strongly agree)



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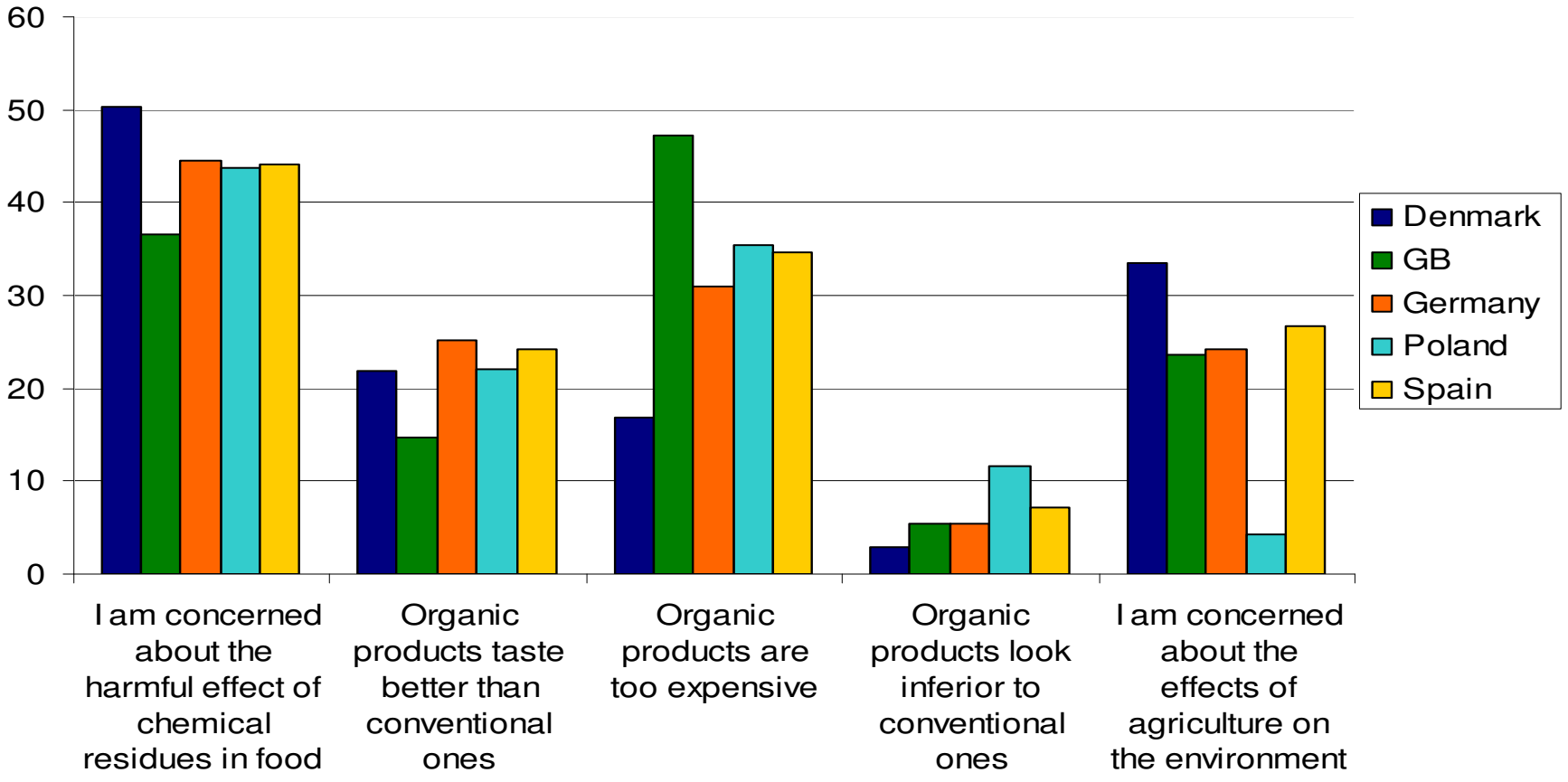
Descriptive results:

✓Respondents were asked attitudinal questions about organic products and farming methods.



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Descriptive results:

- ✓ Consumers' **attitudes to risk** were tested using a series of attitudinal questions which asked respondents to indicate what they perceived was the level of risk to human health associated with a range of seven food production technologies.
  - ✓ In each study country, **pasteurisation** was regarded as the food production technology with the lowest risk, with **GM technology** being regarded as the technology with the next **lowest risk**.
  - ✓ Pesticides, **artificial growth hormones in animals and irradiation** of foods were regarded as especially **high risk** by between 70 and 90% of consumers in all study countries

Measuring consumer preferences: a choice model application.

Choice experiment results for cornflakes:

Study country	Attribute: product technology			Attribute: product functionality
	Organic	GM with associated environmental benefits	GM with associated health benefits	Less carbohydrate
Denmark	+72%	-30%	-12%	+12%
Germany	+85%	-100%	-17%	Minimal
Spain	+26%	-89%	+3%	Minimal
GB	+1%	-36%	-18%	+8%
Poland	-25%	-157%	Minimal	+12%

Measuring consumer preferences: a choice model application.

Choice experiment results for tomatoes/rapeseeds:

Study country	Attribute: product technology			Attribute: origin
	Organic	GM with associated environmental benefits	GM with associated health benefits	Local production
Denmark (t)	+57%	-42%	-28%	+75%
Germany (ro)	+55%	-62%	-31%	+51%
Spain (t)	+9%	-13%	+2%	+17%
GB (t)	+8%	-50%	-25%	+43%
Poland (ro)	-19%	-145%	-65%	+72%

Measuring consumer preferences: a choice model application.

Conclusions

- Results indicate that consumptions patterns, regarding GM and organic products, do not vary between processed and fresh food.
- Respondents, on average, preferred organic food over conventional and GM food in all countries except in Poland, where people reveal to not be willing to pay for this product compared with conventional food.
- Respondents required compensation in order to choose GM food products associated to environmental or health benefits in all courtiers except in Spain, where revealed to be prepared to pay a premium for GM food with associated health benefits
- GM products with associated environmental benefits are more negatively valued by consumers than GM products with associated health benefits for all countries.

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Conclusions

- Low carbohydrates seem to be relevant, in a positive sense, for British, Danish and Polish consumers. Unlike, in Spain and Germany the analysis do not reveal this attribute as statistically significant.
- Finally, locally produced tomato or rapeseed seems to have a positive influence on consumers utility.

Socio-demographic characteristics

Some characteristics such as income, age, gender and education seem to partially explain some attitude differences in GM and organic food WTP.

Thank you for your attention.