CREDA
CENTRE DE RECERCA EN ECONOMIA
I DESENVOLUPAMENT AGROALIMENTARI

UPC

IRTA
RECERCA | TECNOLOGIA AGROALIMENTÀRIES

Parc Mediterrani de la Tecnologia
Edifici ESAB
Avinguda del Canal Olímpic 15
08860 Castelldefels

Consumers' attitudes and preferences towards pig castration: the trade-off between animal welfare and hedonism

GIL. J.M. and KALLAS. Z.

Center for Agro-food Economy and Development

UPC - IRTA (CREDA)

Chema.gil@upc.edu

61st Annual Meeting of the European Association for Animal Production. Session 17
August 23rd- 27th 2010 Heraklion . Crete Island. Greece.

MOTIVATION

- The hypothesis is that Pigs are castrated to improve meat sensory quality.
- This practice has generated a debate within the European Union because of its potential impact on animal welfare.
- At EU level. the Directive 91/630/EEC of November 1991 regulates the minimum standards of welfare in pig production.
- This directive has been amended by another 2001/93/EC where the maximum age for castrate pigs without anesthesia is only 1 week.
- The change in European regulations to a higher level of animal welfare has been driven primarily by increased sensibility of the European consumers.
- This Work try to contribute to literature in analyzing the importance of animal welfare on consumer decision by comparing two countries with different production system (UK and Spain).

OBJECTIVES

- **The aim of this study is:**
  - **To gain insight into consumer acceptance and attitudes towards castration and boar taint.**
  - **To analyze the trade-offs among attributes that UK and Spanish consumers face when purchasing pork**

PRESENTATION OUTLINE

1. METHODOLOGICAL FRAMEWORK
2. METHODS
   - 2.1. QUESTIONNAIRE DESIGN
   - 2.2. THE ANALYTICAL HIERARCHY PROCESS (AHP)
   - 2.3. THE CONTINGENT VALUATION (CV)
3. EMPIRICAL APPLICATION
   - 3.1. EMPIRICAL APPLICATION OF THE AHP
   - 3.2. EMPIRICAL APPLICATION OF THE CV
4. RESULTS
5. CONCLUDING REMARKS

1. METHODOLOGICAL FRAMEWORK

- Data used in this analysis were obtained from face-to-face questionnaires with UK and Spanish consumers.
- Consumers were selected if they are "responsible of food purchasing" and "regular consumer of pork meat".
- The survey was carried out by two specialized research companies:
  - a) Sensory Dimensions for the UK consumers (Reading).
  - b) Applus for the Spanish consumers (Barcelona).
- Stratified representative samples (UK and Spain) were used on the basis of age and gender.

Total number of consumers analyzed

Countries	*Number of observation*
Spain	138
United Kingdom	147

PRESENTATION OUTLINE

1. METHODOLOGICAL FRAMEWORK
2. METHODS
   - 2.1. QUESTIONNAIRE DESIGN
   - 2.2. THE ANALYTICAL HIERARCHY PROCESS (AHP)
   - 2.3. THE CONTINGENT VALUATION (CV)
3. EMPIRICAL APPLICATION
   - 3.1. EMPIRICAL APPLICATION OF THE AHP
   - 3.2. EMPIRICAL APPLICATION OF THE CV
4. RESULTS
5. CONCLUDING REMARKS

2. METHODS

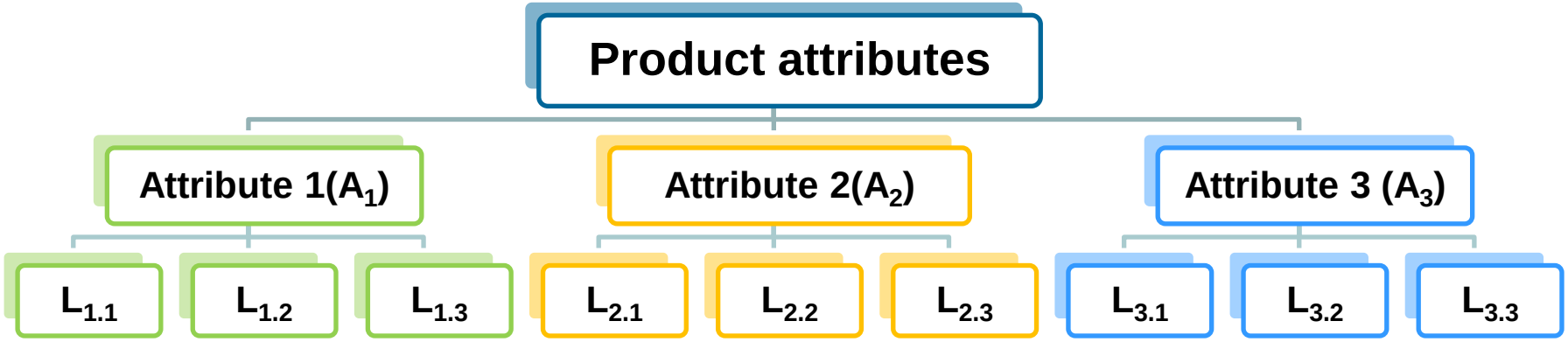
2.1. QUESTIONNAIRE DESIGN

- **The questionnaire considered in six block:**
  1. **Pork meat consumption.**
  2. **Pig welfare attitudes.**
  3. **Castration and knowledge.**
  4. **Pork meat and animal welfare preferences (Analytical Hierarchy Process, AHP).**
  5. **The Willingness to pay for animal welfare and sensorial quality (Contingent Valuation, CV).**
  6. **Socio demographic and life style variables.**

PRESENTATION OUTLINE

2.2. THE ANALYTICAL HIERARCHY PROCESS

- **Hierarchical structure used to value product attributes and levels**



- **The relative importance or weights (*w*) of attributes (A_n) and levels ($L_{n.p}$). where n *(1. ... . N)* is the number of attributes and *p (=1. ... . P)* is the number of levels. are obtained from a pair-wise comparisons.**

2.2. THE ANALYTICAL HIERARCHY PROCESS

- From the **PAIRWISE COMPARISONS** provided. a matrix is generated for each individual *k (1. ... . K)* known as Saaty matrix. where a_{ijk} represents the value obtained from the comparison between attribute/level *i* (*i*∈N / *i*∈P) and attribute/level *j*; (*j*∈N / *j*∈P) for each individual *k.*

$$A_k = \begin{bmatrix} a_{11k} & a_{12k} & \dots & a_{1nk} \\ a_{21k} & a_{22k} & \dots & a_{2nk} \\ \dots & \dots & a_{ijk} & \dots \\ a_{n1k} & a_{n2k} & \dots & a_{nnk} \end{bmatrix}$$

- **LOCAL WEIGHTS** (W) assigned by subject (k) to each attribute (A) and levels (L) are obtained Following the Row Geometric Mean approach:

$$w_{ik} = \sqrt[N,P]{\prod_{i=1}^{i=N,P} a_{ijk}}$$

2.2. THE ANALYTICAL HIERARCHY PROCESS

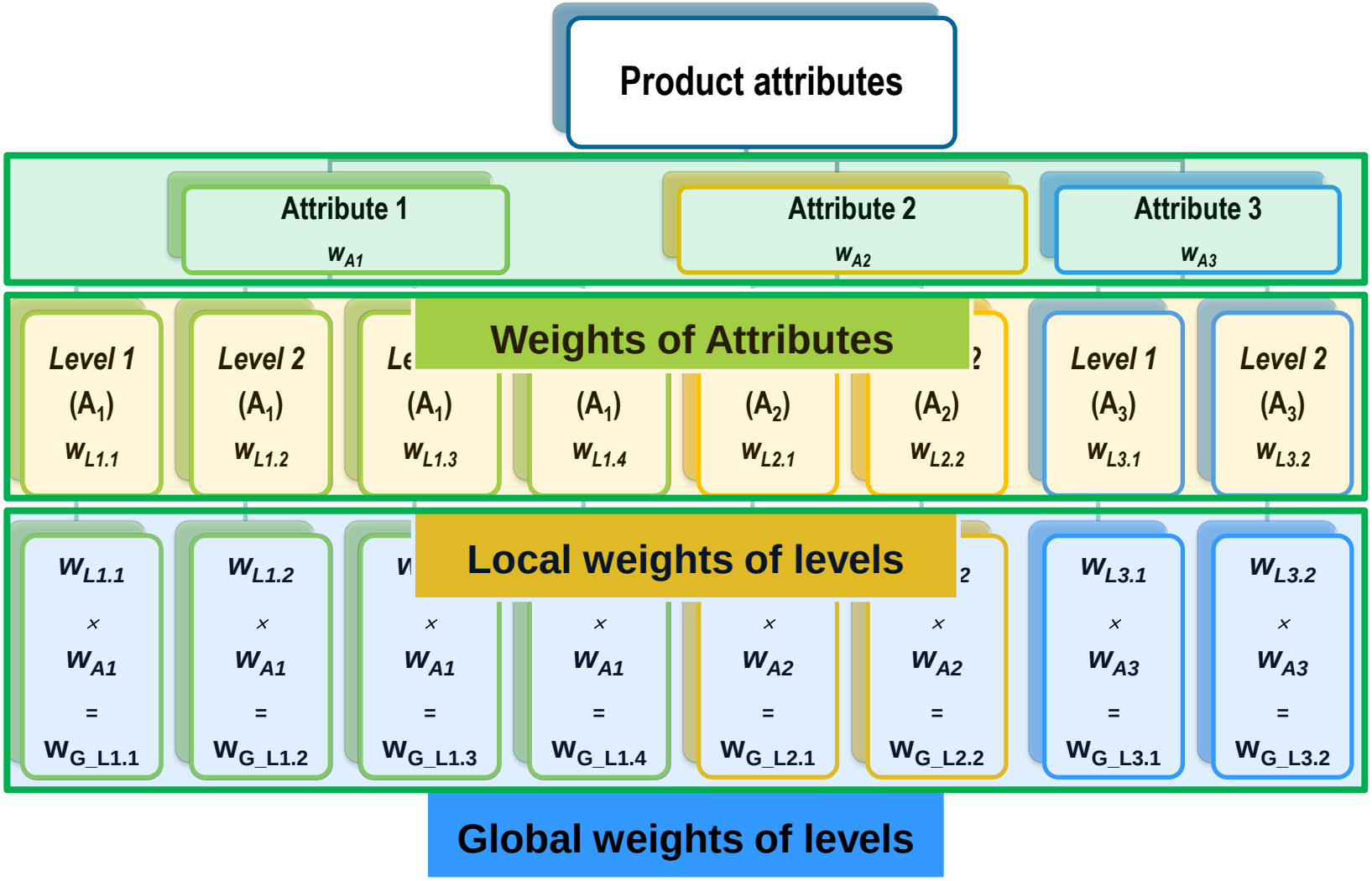
- AHP was originally conceived for individual decision-making. but it was rapidly extended as a valid technique for the analysis of group decisions.
- For aggregating individual weights (w_{ik}) in a social collective decision-making context is that of the geometric mean (Saaty. 1980):

$$w_i = \sqrt[K]{\prod_{k=1}^{k=K} w_{ik}}$$

- To obtain the order of weights for all levels we need to calculate a GLOBAL WEIGHT ($w_{G\_Ln.p}$)
- This global levels' weight is obtained by multiplying aggregated levels' weights (w_i for each level $L_{n.p}$) with its corresponding Attribute weight (w_i for each A_n)

$$w_{G\_Ln.p} = w_{An} \times w_{Ln.p}$$

2.2. THE ANALYTICAL HIERARCHY PROCESS



PRESENTATION OUTLINE

1. METHODOLOGICAL FRAMEWORK
2. METHODS
   - 2.1. QUESTIONNAIRE DESIGN
   - 2.2. THE ANALYTICAL HIERARCHY PROCESS (AHP)
   - 2.3. THE CONTINGENT VALUATION (CV)
3. EMPIRICAL APPLICATION
   - 3.1. EMPIRICAL APPLICATION OF THE AHP
   - 3.2. EMPIRICAL APPLICATION OF THE CV
4. RESULTS
5. CONCLUDING REMARKS

2.3. CONTINGENT VALUATION

- Contingent Valuation (CV) is one of the most frequently used monetary valuation techniques.
- Several formats to elicit Willingness to Pay (WTP) have been used in CV.
- We use a "PAYMENT CARD" format. as it combines both the advantages of open-ended formats (elicitation of point information of WTP) and closed formats (ease of cognitive burden on interviewees).

- The willingness to pay for The Product X is: (Choose from the list below €/kg).

0	0.25	0.50	0.75	1	1.25	1.5	1.75	2	2.25	2.50	2.75	3

2.3. CONTINGENT VALUATION

- **We use the "*Cheap Talk*" approach which involves use of an entreaty to the respondent prior to presenting the valuation question.**
- **The "cheap talk" label was borrowed from experimental economics where it refers to communication between players prior to execution of an experiment. Here cheap talk refers to communication from the experimenter to the participant about things to consider when responding to a subsequent question.**

Previous studies indicate that individuals in general respond to surveys differently from the way they act in real life. It is quite common to find that individuals say they are willing to pay higher prices than those that they are really willing to pay. We believe that this is due to the difficulty in calculating the exact impact of these higher expenses on the household economy. It is easy to be generous when in reality one does not need to pay more in the shop

PRESENTATION OUTLINE

3. EMPIRICAL APPLICATION

3.1. EMPIRICAL APPLICATION OF THE AHP

Attributes and levels of fresh pork meat preference

Attributes	Attributes symbols	Levels	Levels symbol
Gender of the Pig	(A_1)	Female	$L_{1.1*}$
		Entire male (Non-castrated)	$L_{1.2}$
		Castrated male with anesthesia	$L_{1.3}$
		Castrated male without anesthesia	$L_{1.4}$
Taste and odor	(A_2)	Could be Unpleasant	$L_{2.1*}$
		Normal	$L_{2.2}$
Pig origin	(A_3)	Imported	$L_{3.1*}$
		National	$L_{3.2}$
Price	(A_4)	6.00 €	$L_{4.1*}$
		7.00 €	$L_{4.2}$
		8.00 €	$L_{4.3}$
		9.00 €	$L_{4.4}$

3. EMPIRICAL APPLICATION

3.1. EMPIRICAL APPLICATION OF THE AHP

A3: Pig origin									A4: Price							
9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
B1: Entire male (Non-castrated)									B2: Castrated male with anesthesia							
9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
D1: Pig Origin is National									D2: Pig origin is Imported							
9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9
B2: Castrated male with anesthesia									B4: Female							
9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9

PRESENTATION OUTLINE

3. EMPIRICAL APPLICATION

3.1. EMPIRICAL APPLICATION OF THE CV

- **ENSURING SENSORIAL QUALITY** (taste and odor) of fresh pork meat from entire pig (non-castrated) implies higher costs to farmers as some controls have to be undertaken in order to remove products with unpleasant smell from the fresh meat chain. Taking into account that in Spain the average price of pork loan is 7€/Kg. how much MORE you would be willing to pay for the pork meat to guarantee sensorial quality?

- **RESPECTING PIG WELFARE** beyond the minimum standards implies higher costs for farmers. Taking into account that in Spain the average price of pork loan is 7€/Kg. how much MORE you would be willing to pay for the pork meat with a label in which animal welfare is guaranteed?

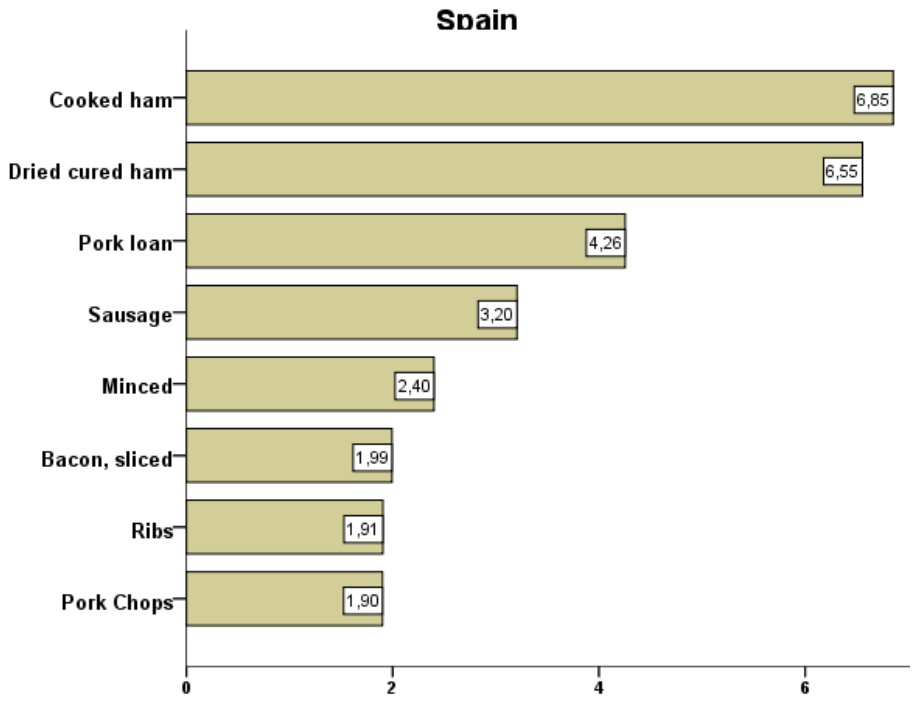
PRESENTATION OUTLINE

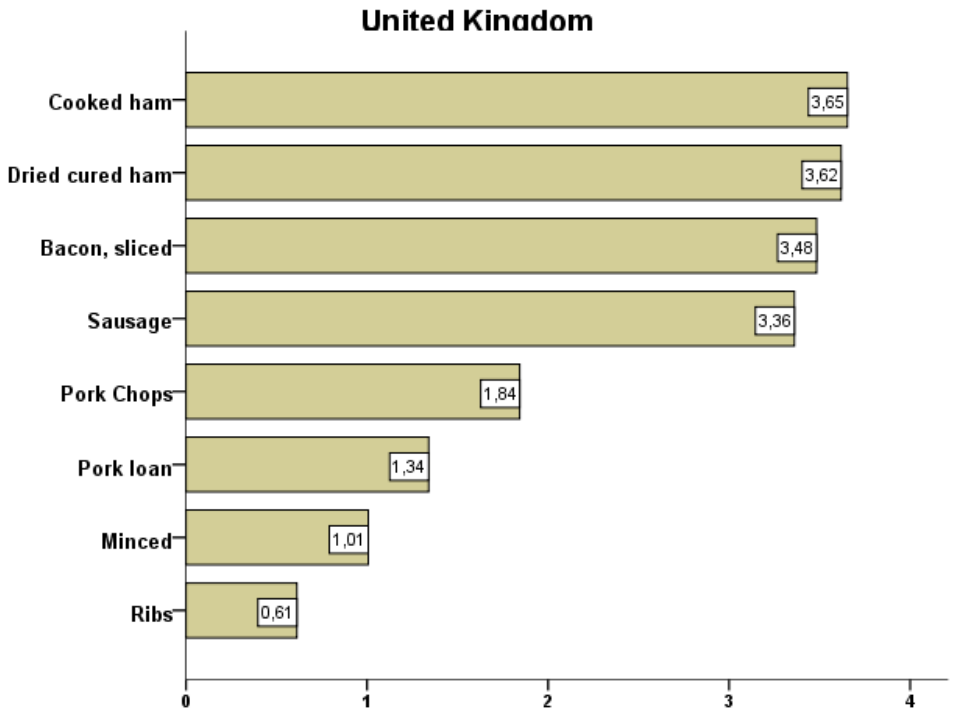
5. RESULTS

Socio demographic variables Results		Spain	United Kingdom
Gender	Female	54.0%	49.7%
	Male	46.0%	50.3%
Age	Less than 25 years	9.6%	19.2%
	From 25 to 39 years	31.1%	17.8%
	From 40 to 54 years	39.3%	32.2%
	More than 55 years	20.0 %	30.8%
Income	Low income	46.6%	27.8%
	Average Income	33.1%	28.7%
	High income	20.3%	43.5%
Education	Not completed primary studies	2.9%	-
	Primary studies	12.4%	4.8%
	Secondary studies	54.7%	61.9%
	University studies	29.9%	33.3%
Total Family member		3.2	3.6

5. RESULTS

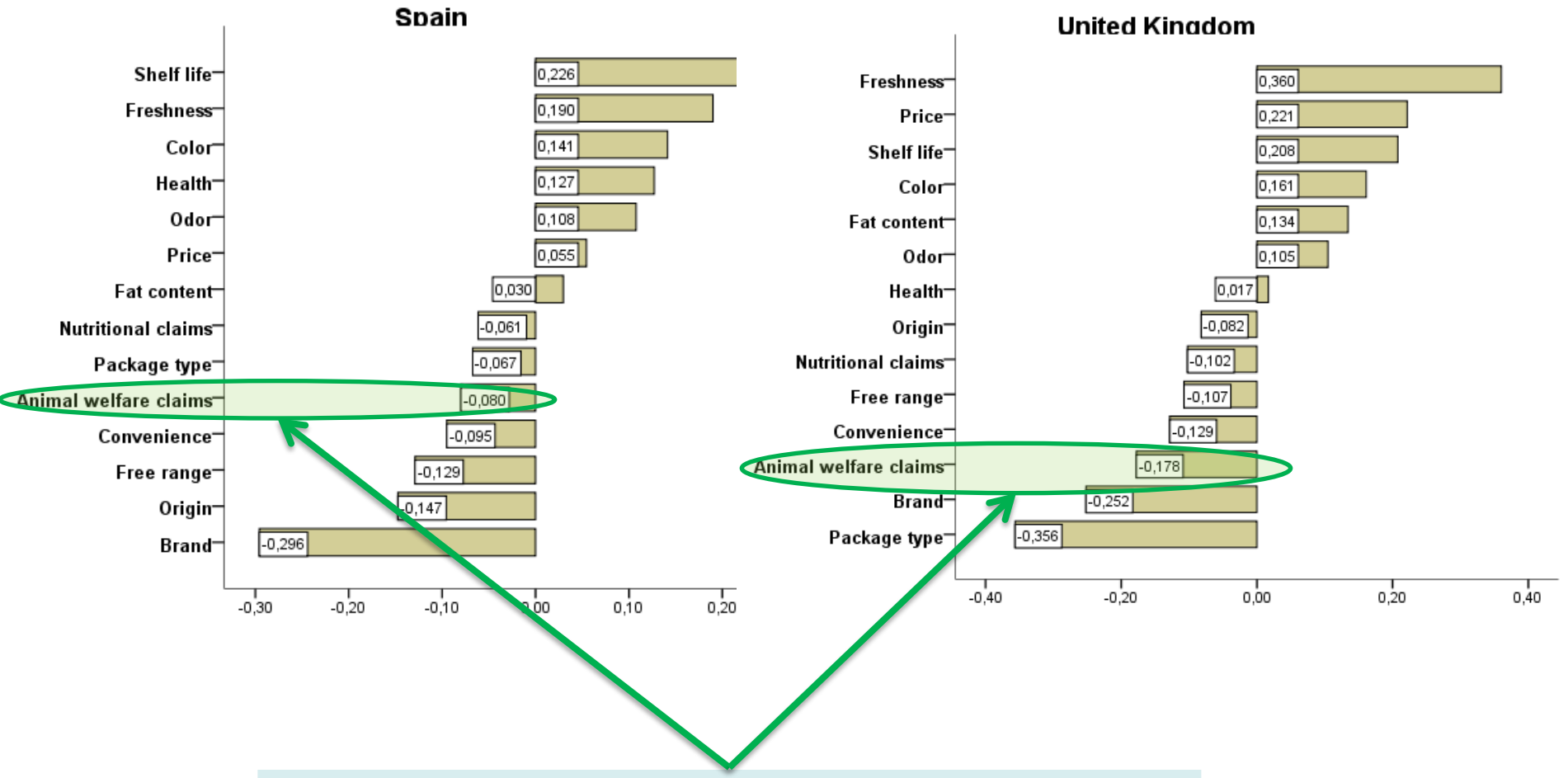
Pork meat consumption (times a month)





5. RESULTS

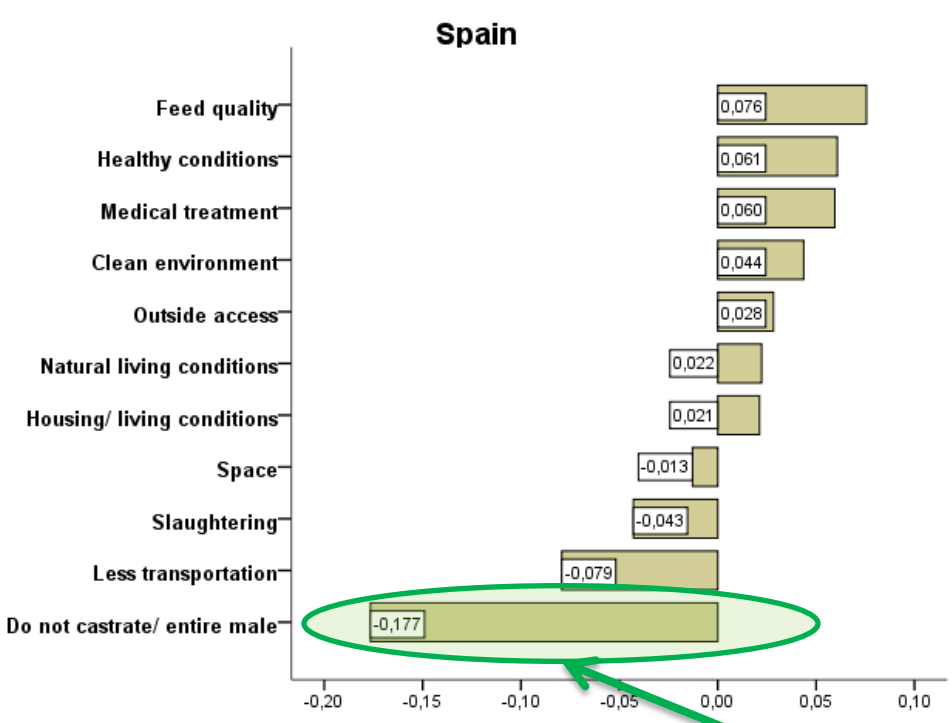
Aspects when purchasing fresh pork meat

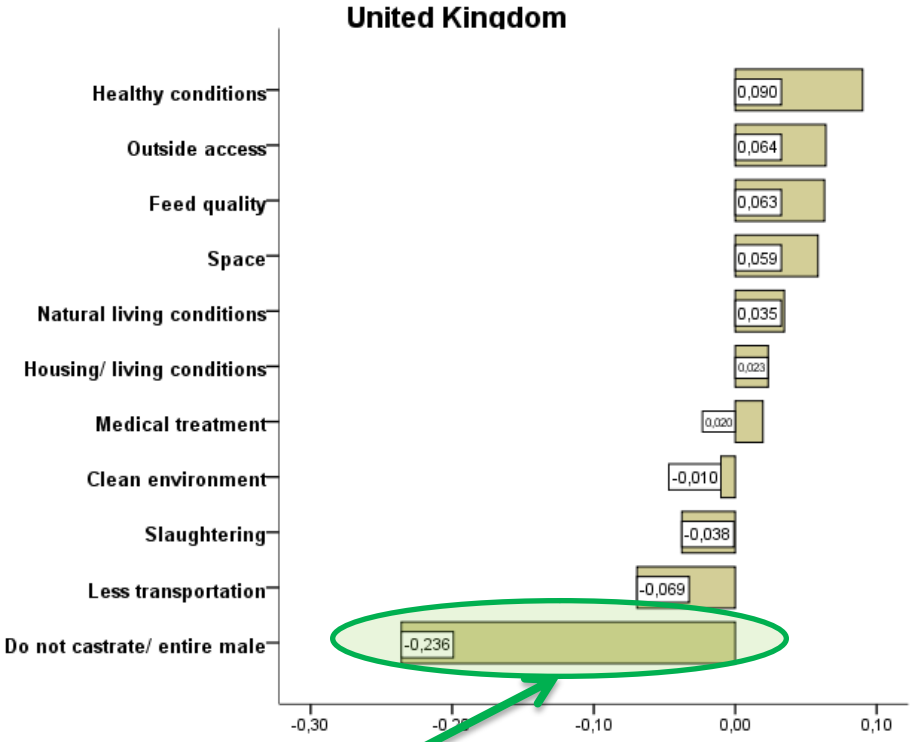


"Animal Welfare Claims"

5. RESULTS

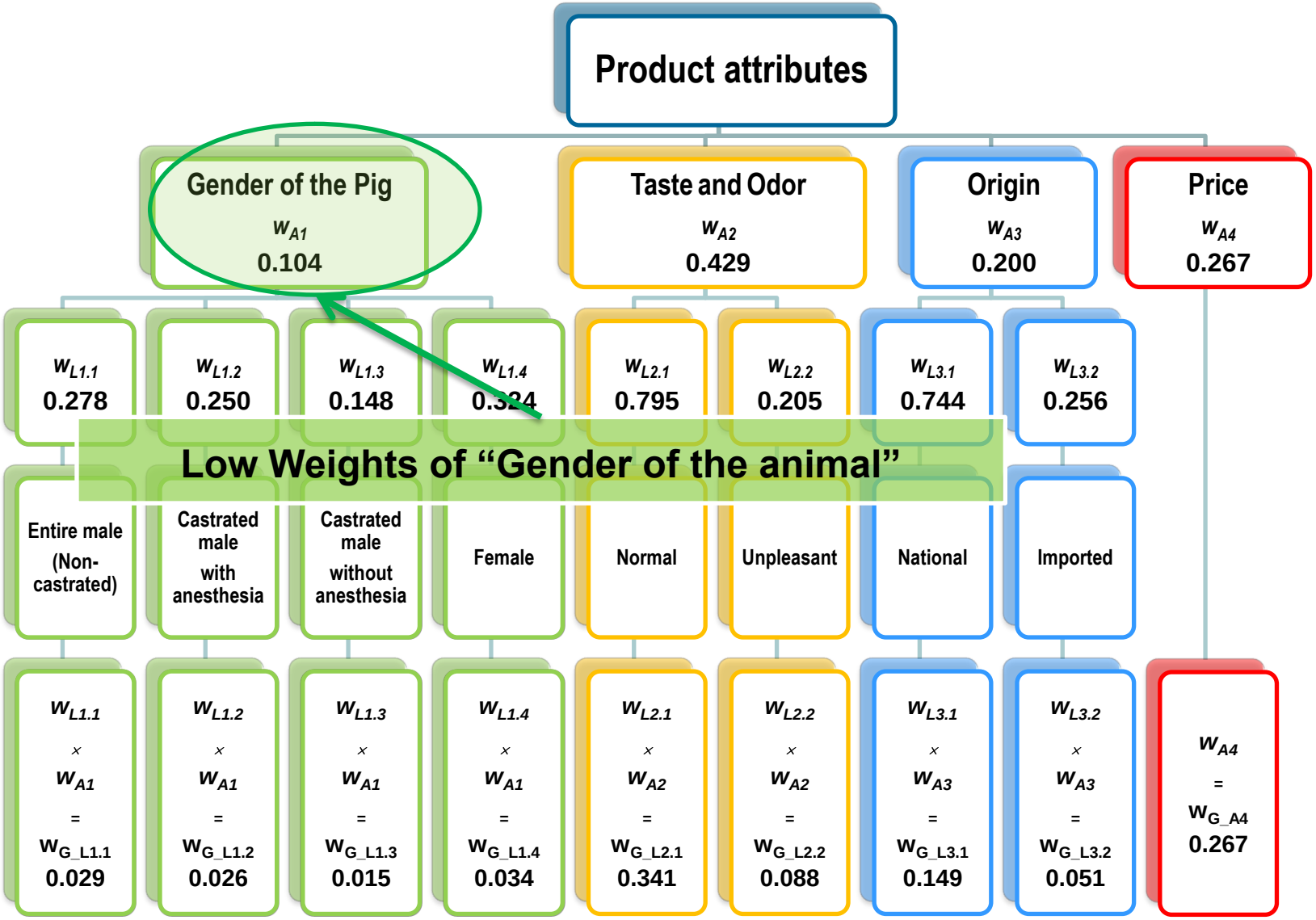
Different aspects in considering pig welfare



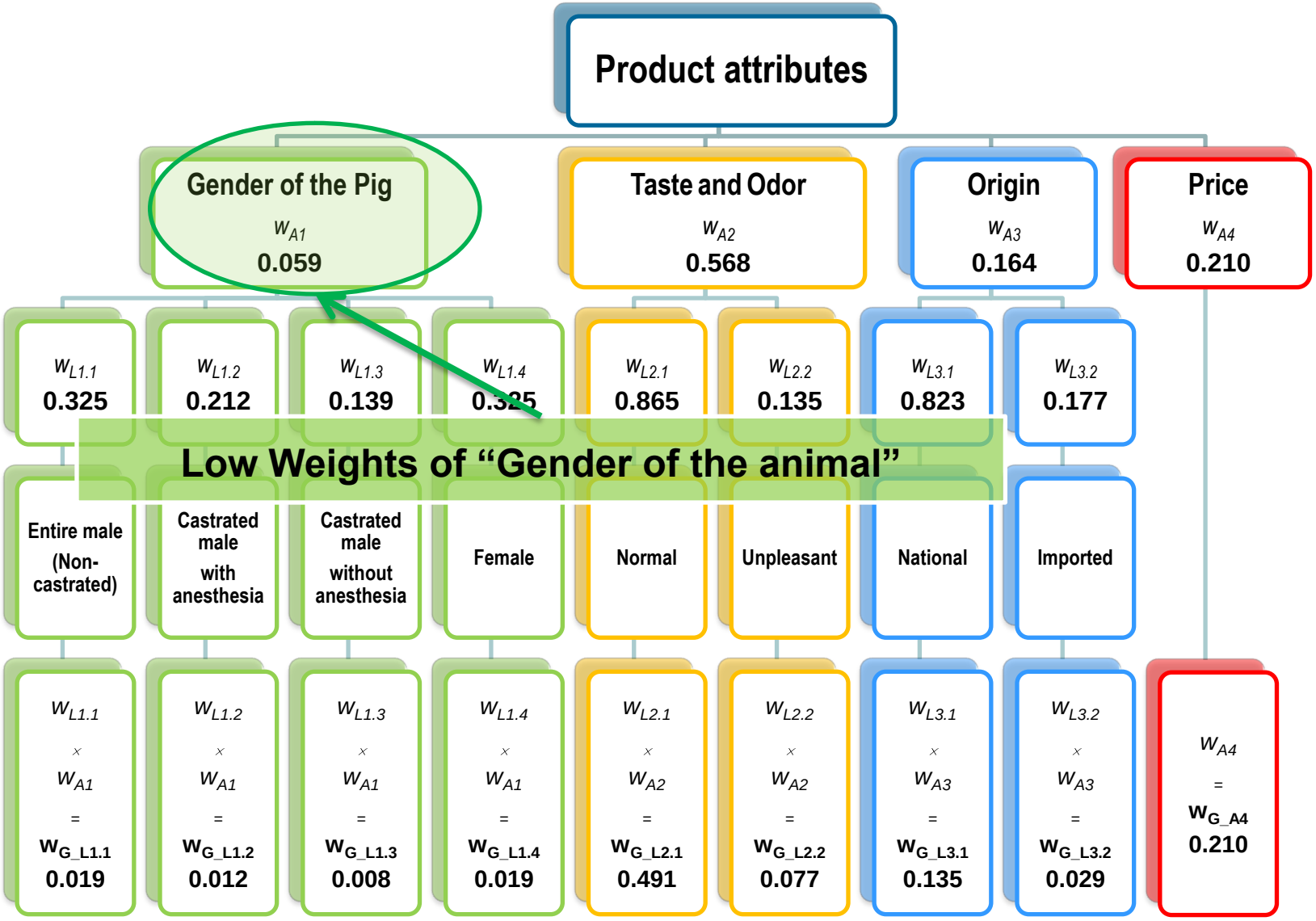


"Do not Castrate"

AHP Results: United Kingdom



AHP Results: Spain

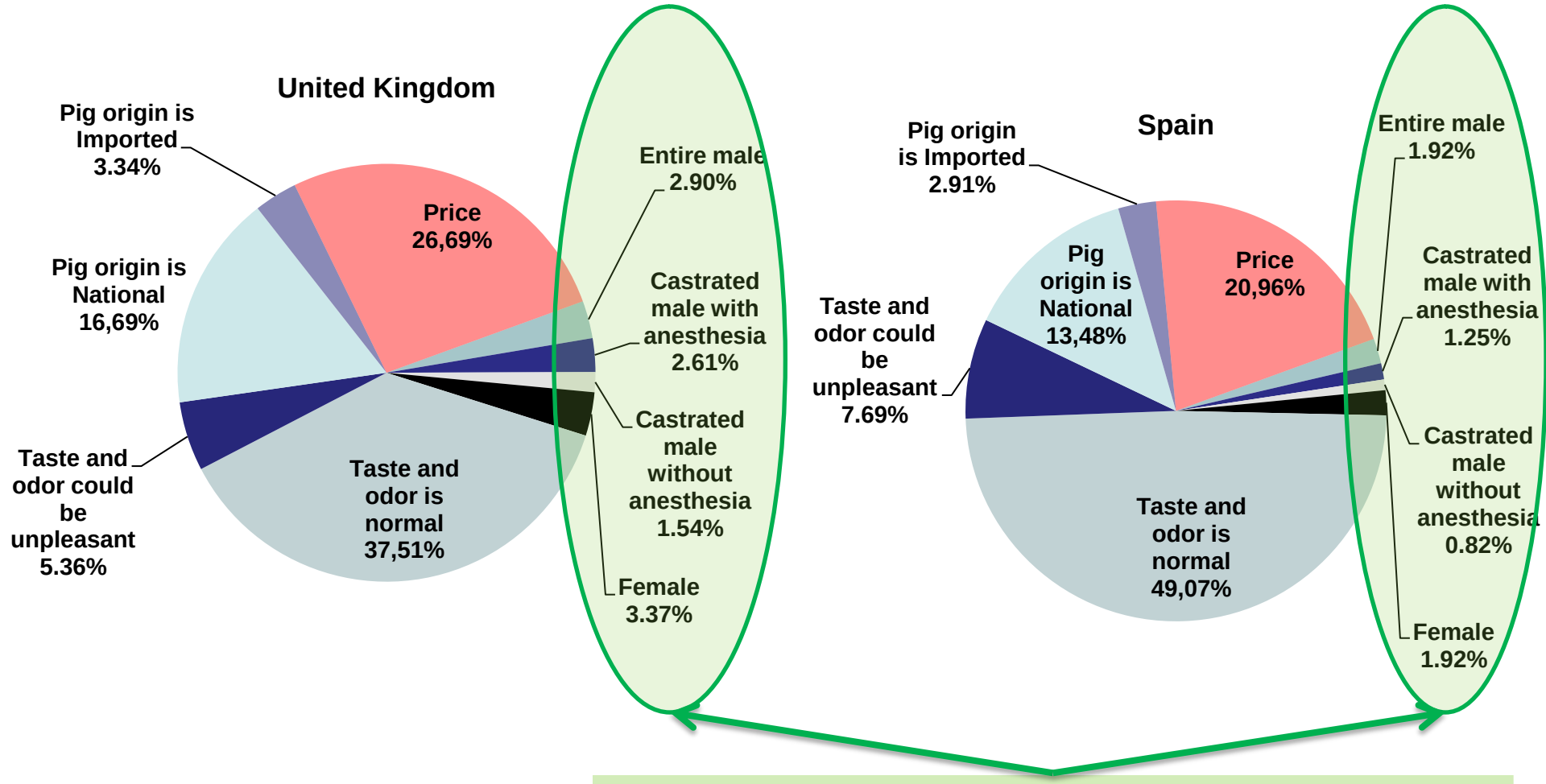


AHP results: Local Weights (Spain Vs UK)

Attributes and Levels	Spain	United Kingdom	Sig.
Gender of the animal	5.90%	10.42%	***
Taste and odor	56.76%	42.86%	***
Pig origin	16.38%	20.02%	-
Price	20.96%	26.69%	***
Entire male (Non-castrated)	32.48%	27.83%	**
Castrated male with anesthesia	21.16%	25.00%	
Castrated male without anesthesia	13.87%	14.81%	
Female	32.49%	32.36%	
Taste and odor is Normal	86.45%	79.51%	***
Taste and odor could be Strong	13.55%	20.49%	***
National origin of pig	82.25%	74.40%	***
Imported	17.75%	25.60%	***

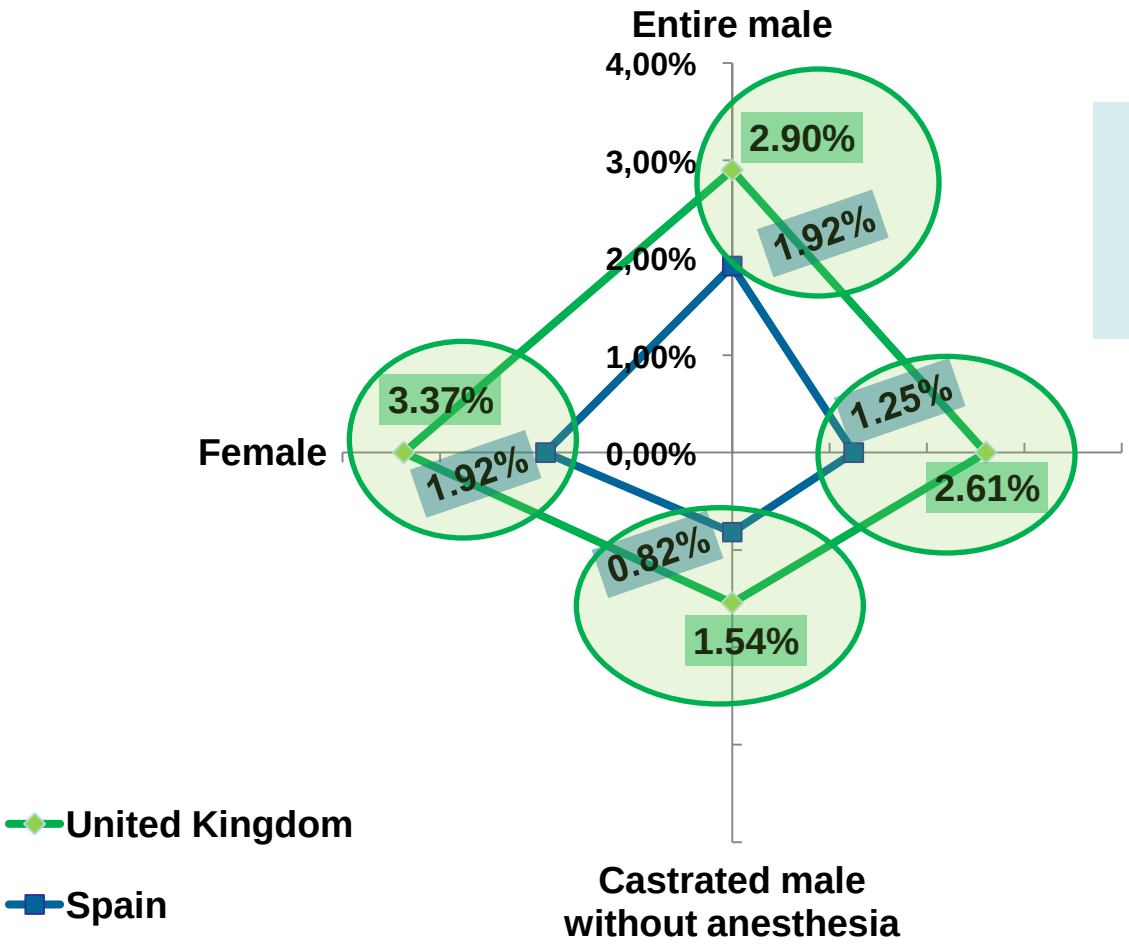
Significance levels: ***p < 0.01; **p < 0.05; *p < 0.10)

AHP results: Global Weights (Spain Vs UK)



Global Weights of "Gender of the animal"

Gender of the animal (Global weights)



Differences for animal Gender are statistically significant ($p < 0.01$)

Contingent Valuation Results: Spain

Countries	*WTP for Sensorial quality*	*WTP for animal welfare*
Spain	*1.41 €/Kg*	*1.37 €/Kg*
United Kingdom	*1.30 €/Kg*	*1.47 €/Kg*

No Significant Difference

Cluster Analysis based on WTP for animal welafre

CLUSTER ANALYSIS

(WTP for animal welfare as Classification Variable)

Spain — **(p < 0.01)**

- ✓ Cluster 1
- ✓ 71 Obs.
- ✓ 0.68 €/Kg

- ✓ Cluster 2
- ✓ 67 Obs.
- ✓ 2.11 €/Kg

UK — **(p < 0.01)**

- ✓ Cluster 1
- ✓ 106 Obs.
- ✓ 1.06 €/Kg

- ✓ Cluster 2
- ✓ 41 Obs.
- ✓ 2.56 €/Kg

CLUSTER ANALYSIS RESULTS

0.68€/Kg 2.11€/Kg

SPAIN (WTP for animal welfare)

Variables	Cluster 1	Cluster 2
Gender	53.5% Man	62.1% women
Animal welfare claims (1-9)	6.16	7.50
Free range (1-9)	6.22	7.05
Cooked ham (times a month)	5.67	8.09
Health (1-9)	7.83	8.45
Nutritional claims (1-9)	6.37	7.24
Housing/ living conditions (1-9)	7.73	8.16
Natural living conditions (1-9)	7.71	8.27
Less transportation (1-9)	6.50	7.35
Slaughtering (1-9)	6.98	7.71

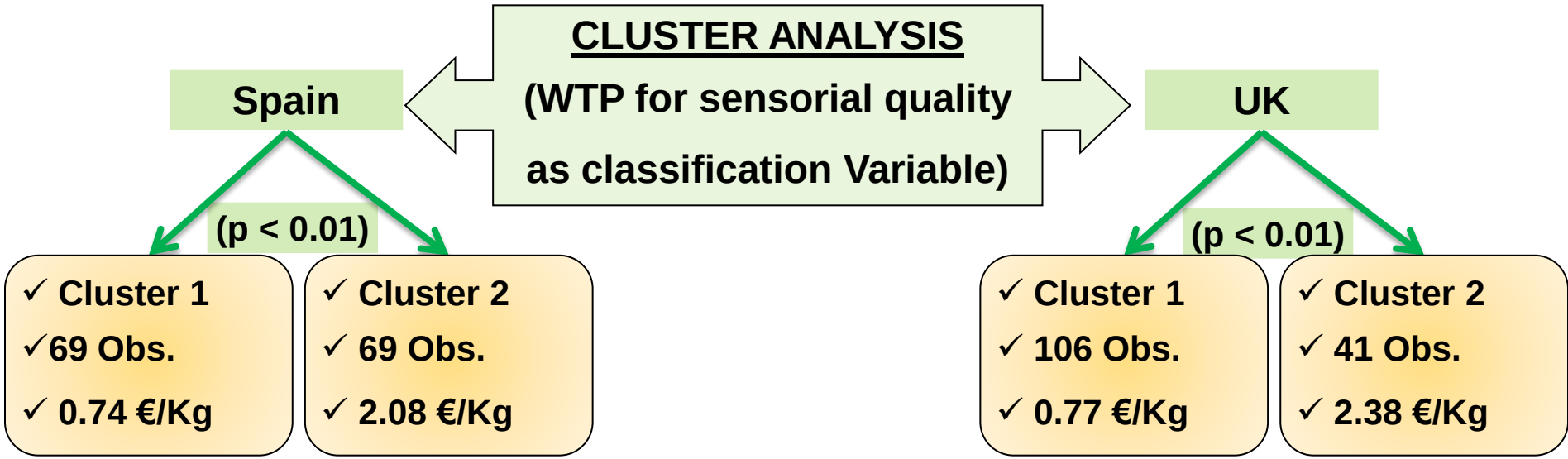
1.06€/Kg 2.56€/Kg

UK (WTP for animal welfare)

Variables	Cluster 1	Cluster 2
Gender	55.7 % Man	63.4% women
Animal welfare claims (1-9)	4.59	6.26
Free range (1-9)	4.93	6.71
Natural living conditions (1-9)	7.50	8.08
Less transportation (1-9)	6.80	7.47
Pork Chops (1-9)	1.99	1.46
Medical treatment (1-9)	7.52	8.19
I think pig males should not be castrated (1-9)	5.82	6.48

Women with positive animal welfare attitude

Cluster Analysis based on WTP for Sensorial Quality



CLUSTER ANALYSIS RESULTS

0.74€/Kg 2.08€/Kg

SPAIN (WTP for Sensorial Quality)		
Variables	Cluster 1	Cluster 2
Gender	55.1 % Man	63.2% Women
At the butcher	65%	51%
Eating 5 or more daily fruit and vegetables (1-9)	4.46	5.45
Smoking level (1-9)	3.13	2.31
Brand (1-9)	4.48	5.85
Nutritional claims (1-9)	6.34	7.23
Shelf life (1-9)	8.41	8.78
Animal welfare claims (1-9)	6.17	7.43

0.77€/Kg 2.38€/Kg

UK (WTP for Sensorial Quality)		
Variables	Cluster 1	Cluster 2
Age	46.84	39.63
At the butcher	22%	37%
Animal welfare claims (1-9)	4.61	5.93
Price (1-9)	7.22	6.66
Health (1-9)	5.85	6.51
I would like to see meat from castrated labelled (1-9)	6.30	7.08

Higher WTP: Young and Women with health concerns

PRESENTATION OUTLINE

5. CONCLUDING REMARKS

- There is a <u>LACK OF INFORMATION</u> about "gender of the animal" attribute and as a consequence about "pig castration methods". The aggregated weight of this attribute represent only a 5.90% to 10.42% within consumer decisions.
- <u>ANIMAL WELFARE IS NOT IMPORTANT</u> factor when consumer decide to acquire fresh pork meat.
- <u>CASTRATION OF THE PIGS IS NOT CONSIDERED</u> to be a relevant factor in considering animal welfare.

5. CONCLUDING REMARKS

- **CONSUMERS PREFERENCES reveals a higher importance of "sensorial quality" of the meat compared to "animal welfare" (AHP). However, the Willingness to pay for both reveal similar monetary values (CV).**
- **Some limitations of the STATED PREFERENCE METHODS as a hypothetical market simulation techi9nques (AHP and CV).**
- **The importance to apply REVEALED PREFERENCE METHODS (Experimental auction, choice experiments with monetary incentives among others).**