Meeting European consumers' demand for imported beef

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Abstract

Utility cut-off values allow consumers to use simplifying decision strategies to lower the cognitive burden of decision making. Product attributes that do not pass the cut-off values are either not being considered by the individual or considered but with a great discount on their values. This study provides deeper insights into consumers' use of attribute cut-off values when making choices. More specifically, we focus on "involvement," one of the potential drivers of both attribute cut-off use and cut-off violation. Involvement is considered a key component in consumer choice theory. We combine data from an online choice experiment for beef using shelf simulations with questions to define respondents' attribute cut-off values, and the validated Personal Involvement Inventory (PII). Evidence from the analysis indicates that consumers who are highly involved are more likely to exhibit attribute cut-off values. Also, highly involved consumers are less likely of violating their cut-off values. At the same, the lower the involvement the lower the probability to have cut-off values developed.

Key Words. Beef, Choice experiment, Consumer segmentation, Cut-off value violation, Decision strategy

Topics Consumer behavior: preference analysis

Introduction

The conventional utility-maximizing decision and choice models often assume individuals have access to and in fact use full product information when making choices (McFadden, 1981). Individuals are also assumed to compensate the loss of utility from not obtaining certain desired product attributes by the gain in utility from obtaining the desired ones. This assumption is often known as the fully-compensatory rule (Swait, 2001). However, the development of general understanding of human judgment and decision making points to the more plausible assumption of non-compensatory choices in the sense that individuals may not always apply the cognitively costly effort to evaluate all attributes across all products available. This is also known as the simplifying heuristic rules (Heiner, 1983). Frameworks allowing non-compensatory decision rules greatly expand the realm of available models in discrete choice modelling. Most prominent approaches include preference ordering (Gilbride & Allenby, 2004), reference point effects (Hu, 2007), fatigue and learning (Swait & Adamowicz, 2001), habit forming or variety-seeking (Hamermesh, 2005), as well as utility cut-off values(Swait, 2001).

Utility cut-off values allow decision makers to use simplifying strategies to improve decision making by employing certain cut-off criteria. Attributes that do not pass the cut-off values would either not be considered by the decision maker or would be considered but with a great discount on their values. In a study on products such as beef, when possibly controversial attributes (e.g., growth-enhancing hormones) or attributes that may generate strong consumer heterogeneity (e.g., country of origin) are included, a model allowing utility cut-offs is particularly relevant (Ding, Veeman, & Adamowicz, 2012). Various authors suggested different choice models to account for cut-off levels. Andrews and Srinivasan (1995) examined the effects of uniformly defined cut-offs, also known as the hard cut-offs, to choices. Swait (2001) expanded the framework by allowing choices to violate the cut-offs. Martínez et al. (2009) considered a data-driven definition of cut-offs where the cut-offs were determined simultaneously with the choice model parameters. Danielis and Marcucci (2007) and Ding et al. (2012) focused primarily on the cause of utility cut-offs and used a series of variables to explain the cut-off values.

While recognition and incorporation of cut-off values in models of consumer decision making has become more popular in recent literature, very little is known about the characteristics of consumers who use cut-offs beyond demographic features. This study

provides deeper insights into consumers' use of attribute cut-offs by focusing on one of the potential drivers of the use, or violation, of personal cut-off values – "involvement" – which is considered a key component in consumer choice theory. Involvement is an unobservable "state of motivation, arousal or interest. It is driven by current external variables (the situation, the product, the communication) and past internal variables (enduring, ego, central values)" (Rothschild, 1984). In other words, it refers to the level of "perceived personal relevance" or interest evoked by a stimulus, which the consumer links to enduring or situation-specific goals (Mitchell, 1979; Judith L. Zaichkowsky, 1985). Involvement explains parts of the decision-making process, including extensiveness of information search (Verbeke & Vackier, 2004), which is closely related to the reasons for using attribute cut-off values, namely reducing cognitive efforts attached to compensatory decision rules.

To develop a characterization of consumers with respect to their utilization of cut-off levels and the role of product involvement we combine data from an online choice experiment using shelf simulations, questions to define respondents' attribute cut-off values (e.g., Ding et al. 2012), and the validated Personal Involvement Inventory (PII) instrument (Judith Lynne Zaichkowsky, 1994). Our choice experiment elicited consumers' preferences for beef characterized by five attributes: price, country of origin, growth hormones, quality and safety, and promotional labels. These attributes allow for testing utility cut-off values and possible violations as it relates to involvement since previous literature has shown heterogeneous preferences for beef choices based on growth hormone free production and country of origin. We hypothesize that highly involved consumers are more likely to demonstrate attribute cut-off values while at the same time having a lower probability of violating their cut-offs. Similarly, the lower the involvement the lower the probability to have cut-off values developed. In addition, we account for consumer socio-demographics that may play a role for segmentation regarding beef choices.

The remainder of the paper is as follows. We describe the design of the choice experiments, the survey instruments used and the latent class choice model applied to the data. Next, we present the empirical results. Finally, we discuss our findings and provide some concluding remarks.

Methodology/data

Choice Experiments

In order to collect data on consumers' decision making an online choice experiment was conducted using shelf simulation (Mueller Loose, Peschel, & Grebitus, 2013). Together with survey questions on involvement and cut-off values for beef this enables us to determine how consumers' product involvement impacts their preference and use of cut-off values for beef. Participants made choices over products characterized by five attributes: price, country of origin, a growth hormone free label, the German Quality and Safety seal, a promotional gourmet label. The countries included in the experiment were Germany, Argentina, France, Canada, U.S.A., and G.B. Similar to Grebitus, Jensen, Roosen, & Sebranek (2013), the price attribute levels were determined through market observation of beef. Table 1 displays the product attributes and levels.

Table 1. Product Attributes and Levels

Attribute	**Description**
Price in Euro/kg	4.88; 5.76; 6.46; 7.27; 8.03; 8.82
Food standard assurance	QS (Quality and Safety) seal; None
Growth hormone free	Not growth hormone treated; None
Promotional claim	Gourmet (premium quality); None
Country of origin	Germany; Argentina; France; Canada; U.S.A.; Great Britain

To generate the design for the choice experiments the software NGENE was used. Each participant made twelve choices. Each choice set contained two alternatives and the "none of these" option. Figure 1 displays an example of the choice set completed by the participants.

Figure 1. Example of a choice set

Alternative A	Alternative B	Alternative C
		**None of these**
I choose __	**I choose __**	**I choose __**

Cut-off values and attribute importance

To elicit hard cut-off criteria, participants had to indicate whether they *only* purchase beef from one of the countries used in the choice experiment, whether they *only* purchase beef with a QS seal, whether they *only* purchase beef with a gourmet label and whether they *only* purchase beef which is not growth hormone treated. In order to validate the relevance of the attributes chosen in the choice experiment participants were also asked to rank a wider range of attributes relevant for beef in addition to the hard cut-off criteria for attributes which are varied in the subsequent choice experiment.

Involvement Measurement

Several measurement instruments exist for eliciting involvement. Examples are the Personal Involvement Inventory (PII) by Zaichkowsky (1994 and 1985), the Involvement Profiles by Kapferer and Laurent (1985), the revision of the PII (RPII) by McQuarrie and Munson (1987), the Involvement Instrument by Higie and Feick (1989), which includes items of Zaichkowsky's PII and McQuarries and Munson's RPII, the FCB Grid by Ratchford (1987) and, the new involvement profile (NIP) by Jain and Srinivasan (1990).

To date, involvement researchers have analysed almost only branded products such as alarm clocks, calculators, radios and colognes. Regarding food products there exist studies on chocolate (Jain and Srinivasan, 1990) and advertisement for ice-cream and Pepsi Cola (Zaichkowsky, 1994), products that are mainly branded. Other studies that have been reported with regard to unbranded, unprocessed foods in general and meat in particular are the studies by Schulz and Hamm (1997), Verbeke and Vackier (2004), and Grebitus (2008). In particular,

Schulz and Hamm (1997) investigated the involvement of beef consumers by means of 28 involvement related items. They distinguished between high, medium and low involvement testing the suitability of involvement measures to explain differences in individual consumer behaviour. Furthermore, the study conducted by Verbeke and Vackier (2004) investigated Belgium consumers' involvement with regard to meat purchase applying the involvement profile by Kapferer and Laurent (1985). Grebitus (2008) tested the NIP for pork in a retail study in Germany. Results show that involvement can be measured with this instrument but not all original five dimensions of this involvement instrument (e.g. the perceived importance of the product; the hedonic value of the product) could be put in place for meat. Against this background, we use the more popular PII (Zaichkowsky, 1994) to investigate underlying reasons for the use of cut-off values.

Analysis and results

Sample description

Before the final version of the survey was distributed a survey pre-test was administered. The survey took place in the Fall of 2013 in Germany. Data were collected by the international market research company Taylor Nelson Sofres (TNS). Only adult (aged 18 and over) shoppers of beef were recruited for the survey. A total of 503 respondents completed the survey. The sample is representative of the average German population. About 47% of the sample are males with an average age of 47, which is slightly older than the average German population. Average household income ranges from €30.000 - €34.999. Roughly 20% of the sample has a bachelor's degree or higher. Some 16% of the sample have children under 12 years of age in their household. The average household size of the sample is 2.17.

Involvement and cut-off criteria

A total of 503 consumers were interviewed. 50 observations are excluded from the analysis since participants indicated to have several countries which they *solely* bought beef from. This leaves data from 453 participants for the analysis. The mean involvement score was at 46.48 (*SD* 10.94) on a scale from 10 to 70. Using a median split to partition the sample based on their involvement score resulted in a significant difference between high and low involved participants (M_L = 38.01, M_H =54.62, $t_{(452)}$ = -24.83, p<.0001). In line with previous research mentioned above, these groups differed with regard to their ranking of importance of relevant

attributes in beef purchases. Table 2 shows that price is the most important attribute for the low involvement consumers, but that country of origin is the most important attribute for the highly involved consumers. The least important attribute for both groups is that the production method employs no growth hormones, probably because this usually not an issue with European beef.

Table 2. Importance ranking of product attributes

Low involvement			**High involvement**		
SD	*Mean*	*Attribute*	*Attribute*	*Mean*	*SD*
3.24	4.52	Price	Country of origin	4.63	3.03
2.94	5.12	Colour	Price	5.13	3.21
2.98	5.21	Country of origin	Colour	5.14	2.87
3.12	5.32	Lean	Quality seal	5.42	2.83
3.00	5.57	Quality seal	Lean	5.73	3.23
3.19	5.64	Date of expiration	Marbling	5.83	3.17
3.23	6.30	Marbling	Date of expiration	6.12	3.27
3.72	7.23	Organic	Gras fed	6.96	3.37
3.15	7.36	Gras fed	Organic	7.03	3.81
2.64	8.33	Nutrition label	Brand	8.52	2.47
2.66	8.36	Brand	Nutrition label	8.57	2.62
3.66	9.03	Growth hormone free production	Growth hormone free production	8.92	3.68

As mentioned before, we asked participants about 4 hard cut-off criteria. 16 % of the sample had no cut-off criteria, about one third each had one or two cut-off criteria, 21 % had three cut-off criteria and as few as 4 % had four cut-off criteria. High involved participants indicated significantly more cut-off criteria than low involved participants ($F_{(1,452)} = 10.76$, $p<.001$).

Three quarters of the sample indicated to only purchase beef free of growth hormone treatments, 45% indicated country of origin as a cut-off criterion, 42% stated to only purchase beef carrying a QS logo and 6% used the gourmet label as cut-off criterion. There were significantly more participants in the high involvement group who had a cut-off criterion for the QS logo and marginally significantly more with a cut-off for hormone treatment (QS: $\chi^2_{(1, 453)} = 8.33$, $p<.01$, Hormone: $\chi^2_{(1, 453)} = 3.48$, $p<.06$).

When looking at the choices participants made, we observe that 80 % of those with a country cut-off criterion violate this at least once and 12 % violate this criterion on all choices. On average the country cut-off criterion is violated 6.28 (*SD* 4.34) times out of the 12 choices. All participants who indicate to use the QS or gourmet label as cut-off, violate this criterion at least once. As for the QS label, 14 % of participants violate this criterion on all

choices, but on average 8.17 (*SD* 2.56) times out of 12. The gourmet cut-off criterion is violated on all choices by 4 % of participants and on average 7.38 (*SD* 2.34) times. There was no significant difference between the share or the number of violations between involvement groups, indicating that there must be another driver responsible for cut-off violations.

Latent class choice analysis

To get a better understanding of the different groups of consumers in our sample, we use a latent class choice model. Latent class models draw on the assumption of finite mixture modeling, i.e. instead of assuming one homogeneous population, it is assumed that a mixture of unobserved segments exists in a population (Greene & Hensher, 2003). These segments are characterized by segment-specific sets of identifiable parameters, where the segment-specific parameters are determined by the probability of a participant to respond in certain patterns to categorical variables. By presenting respondents with a set of alternatives from which they can choose, the attribute preferences are investigated indirectly without asking the participant directly about their subjective valuation of specific product attributes. Eliciting preferences for alternatives enables estimation of the utility an individual derives from the set of presented attributes. Therefore, we employ random utility choice models, which are commonly used as a preference elicitation method (Greene & Hensher, 2003). From this approach of eliciting preferences, it is possible to limit social desirability bias and obtain results which are closer to real preferences, compared to results that can be obtained from direct questionnaire surveys (Norwood & Lusk, 2011). In latent class choice experiments it is assumed that the utility an individual derives from a certain attribute is not individual-specific but depends on the unobservable class membership to one of q = 1,2…Q latent classes. The probability of class membership q depends on individual i choosing alternative j, which consists of a certain set of observable attributes (Greene & Hensher, 2003):

$$(1)\quad Prob_{jit|q} = \frac{\exp(x'_{it,j}\beta_q)}{\sum_{j=1}^{Ji}\exp(x'_{it,j}\beta_q)}$$

It is assumed that there exist a total of Q latent preference classes, which results in the overall log-likelihood:

$$(2)\quad ln\, L = \sum_{j=1}^{J} P_j = ln\left[\sum_{q=1}^{Q} Prob_{jit|q}\right]$$

While this allows segmenting a population based on the observed response pattern, these classes are not informative as to why the utility derived from the given attributes differs. In

order to describe the latent classes with the consumer characteristics of interest, we follow the approach described by Boxall and Adamowicz (2002) to incorporate relevant psychometric constructs and socio-demographic characteristics into the latent class choice model.

Utility and latent classes

We used Latent Gold Choice 4.5 software for model estimation. We first estimate an aggregate multinomial logit (MNL) model as a reference model. As shown in Table 3, all product attributes in the model – price, QS logo, gourmet label, hormone free label and country of origin – were significant and therefore relevant in the decision process. Inclusion of the "no choice" (neither) option in the model improved model fit substantially. The partial contribution of each attribute to the overall model fit, or relative attribute importance (Vermunt & Magidson, 2005), was highest for country of origin and price, explaining 37% and 32% of variance in respondents' choices, respectively. Contrary to the attribute ranking, does the label indicating growth hormone free production explain 16% of variance. The opt out option and the other two labels played a minor role. To arrive at the optimal latent class solution, we ran models with up to seven latent classes and selected a six class model based on the Bayesian information criterion (BIC) and the amount of variance explained as shown in Table 4. Since utility for the gourmet logo did not differ between latent classes, we restricted this attribute to be the same for all classes, resulting in an improved model fit without loss of information. Latent class modelling improved model fit relative to the reference MNL model. To get a better understanding of the composition of the latent classes, we included dummy variables for indication and - where appropriate - violation of a cut-off value, the involvement score as continuous variable as well as age, gender and household income. Since we did not find any difference between segments for gourmet label cut-off utilization, we excluded this variable from the model for classes after restricting the gourmet attribute to be equal across classes.

Table 3. MNL baseline model

Model for Choices			
Pseudo-R^2	0.13		
	Class1	*Wald*	*Importance*
Country of origin		513.38***	.37
Germany	1.11***		
Argentina	.01***		
France	-.07***		
Canada	-.21***		
USA	-.22***		
UK	-.62***		
Price		340.06***	.32
4.88	.74***		
5.67	.38***		
6.46	.23***		
7.24	-.22***		
8.03	-.33***		
8.82	-.79***		
Hormone free	.37***	225.27***	.16
QS	.08***	10.53***	.03
Gourmet	.08***	10.53***	.03
No choice	.20***	167.85***	.08
	LL = -5173.73, BIC(LL) = 10433.08		

Note: *p<0.05; **p<0.01; ***p<0.001

Table 4. Model selection

	LL	*BIC(LL)*	*Npar*	*df*	*p-value*	*Class.Err.*	*Pseudo-R^2*
1-Class	-5173.73	10433.08	14	439	5.2e-1854	.00	.13
2-Class	-3773.14	7772.56	37	416	4.8e-1290	.02	.43
3-Class	-3501.99	7370.93	60	393	3.1e-1193	.03	.47
4-Class	-3341.63	7190.88	83	370	6.8e-1142	.04	.53
5-Class	-3193.11	7034.51	106	347	2.0e-1095	.05	.58
6-Class restricted	**-3098.63**	**6955.62**	**124**	**329**	**5.1e-1068**	**.05**	**.60**
6-Class	-3097.08	6983.10	129	324	1.4e-1070	.05	.60
7-Class	-3037.90	7005.42	152	301	4.5e-1061	.06	.62

Empirical results of the latent class modelling

The choice model results and relative attribute importance are depicted in Table 5 and Table 6. The segments do not differ substantially in size, suggesting an even distribution of preference structure. The largest segment comprises 24% of the sample, classes 2-5 between 15% and 17% and the smallest sample contains 12% of the sample. Overall our German

participants prefer beef from Germany, especially classes 2 and 3. Argentinian and French beef is preferred from a smaller subset of consumers, indicating a general signal for quality (beef) products. Canadian and UK beef does not contribute to utility at all. US beef is only preferred from the smallest class 6. We find two price sensitive segments (class 4 and 6), who gain less utility from German beef than the other segments. Apart from that it seems that a general price cut-off is reached at 7.24€ per kg of beef, since there is no segment which gains utility from higher prices than that. All segments, except class 3, gain utility from the growth hormone free production label, however, it is most preferred by class 5. The QS logo significantly enhances utility for classes 1, 5 and 6. Since we restricted the parameters for the gourmet logo to be equal across classes, the only conclusion we can draw is that participants gain utility if the label is present, but it does not seem to be a decisive factor. Opting out of choice was relevant for classes 2, 3 and to a smaller extent class 5. Similar to the MNL model, country of origin and price are the most relevant product attributes, weighted by segment size. The "neither" option explains a considerable amount of variance, which explains the improved model fit of including this alternative.

Taking involvement, cut-off criteria and demographics into account, the choice pattern become easier to categorize. The first and largest segment is significantly more involved with the product and less likely to violate their cut-off criterion for country of origin as indicated by the significant and positive coefficients for involvement and never violate, respectively. They are more likely than the other classes to indicate a cut-off criterion for growth hormone free production and QS logo. Females with a higher income are overrepresented in this segment. Overall, class 1 can be characterized as highly involved, utilizing more cut-off criteria relative to the other segments, with country of origin being a hard cut-off criterion.

The second class seems to pursue a simple choice strategy by selecting either the alternative with beef from Germany or opting out of choice. Interestingly, this class does not differ significantly from the others with respect to involvement or cut-off criteria utilization. In tendency, this class is actually more likely to violate their country of origin cut-off criterion, as can be seen from the positive parameter estimate for violate country of origin.

The third segment is the least involved segment, making their choice based on country of origin or opting out. Contrary to segment 2, participants in this segment tend not to have a cut-off criterion for country of origin, suggesting that this segment of least involved consumers doesn't even have specific heuristics to simplify their choice. This could explain

the frequent opting out (positive utility coefficient in the choice model), since it is difficult to determine the superior alternative with no a priori determined choice criteria.

The fourth class is one of the price sensitive classes, gaining most utility from the lowest price level. German or Argentinian country of origin are preferred and these cut-off criteria are less likely to be violated from this class relative to the others as indicated by the significant positive coefficient for never violate country of origin. The 'no growth hormone treatment' label adds to utility, even though this class is less likely to indicate this as cut-off criterion. Potentially adding the label might make them more aware of considering hormone treatment as being an issue, which it is normally not on the German market. Not surprisingly with regard to the strong price focus is that in this class males are overrepresented and the segment is younger than the other segments, thereby suggesting a lower income as well.

The fifth class seems to be more deliberate in their decision strategy in terms of utilization of several decision criteria. Moreover and in contrast to the other segment, the no choice option did not play a role for participants in this class. While they gain most utility from German beef, Argentinian and French beef contribute to utility as well. The other three countries discount utility significantly. Class 5 does not gain utility from the lowest price but from the second and third lowest price level. All labels contribute positively to utility. This class doesn't differ significantly in terms of involvement, but just as the highly involved class, is more likely to indicate cut off levels for QS logo and no growth hormone treatment. Interestingly, but not significant is the positive coefficient for no cut-off criterion for country of origin, indicating that participants in this segment do not have a cut-off criterion for country of origin. Potentially this could explain that several countries contribute to utility and not only one. Just as the highly involved segment, this segment has a relatively higher income than the others.

The last class gains most utility out of low prices just as class 4. While they mostly prefer German beef, this class also gains utility from US beef. Just as the deliberate class 5, they gain utility from all labels, including no growth hormone treatment, even though they do not indicate that this was a cut-off criterion. In tendency, this segment indicated least cut-off criteria, probably because price is the only relevant decision criterion for this class.

Table 5. Choice model results

Model for Choices							
	Class1	*Class2*	*Class3*	*Class4*	*Class5*	*Class6*	*Overall*
Relative size	24%	17%	16%	16%	15%	12%	
Pseudo-R²	.25	.77	.06	.61	.34	.33	.60
Attributes	*Class1*	*Class2*	*Class3*	*Class4*	*Class5*	*Class6*	*Wald*
Country of origin							492.28***
Germany	.73***	6.16***	3.91*	.63**	1.82***	.68***	
Argentina	.09	-.58	1.86	.49*	.70***	.32*	
France	.13	.63	-3.34	-.73*	.68***	-.54**	
Canada	-.23***	-.25	.19	-.08	-.71***	-.02	
USA	.01	-5.09	-3.65	-.20	-1.42***	.41*	
UK	-.72***	-.87	1.03	-.11	-1.07***	-.85***	
Price							227.97***
4.88	.27*	.87*	.49	3.29***	.28	2.97***	
5.67	.17	.24	.00	1.31***	.41**	1.64***	
6.46	.24	.67*	-.45	1.11**	.48*	.63**	
7.24	-.13	-.29	-.01	-.60**	-.32*	-.47*	
8.03	-.18	-.93*	.06	-2.04***	-.26	-2.53***	
8.82	-.38**	-.56	-.09	-3.07***	-.59**	-2.23***	
QS	.30***	.16	-.06	-.02	.15*	.41***	45.81***
Gourmet				.14***			18.11***
No hormone treatment	.65***	.50**	-.15	.61***	.92***	.40***	282.32***
No choice	-1.38***	1.97**	3.04***	-1.93***	.22***	.56***	396.93***
Model for Classes							
Intercept	.46	-.36	1.69	1.64	-2.69	-.75	2.68
Involvement	.02*	-.01	-.05***	.02	.02	.00	25.92***
Country							78.35***
Never violate	3.36*	-1.7	-1.99	3.80*	-1.77	-1.70	
Violate	-2.65**	2.4	1.57	-3.28**	.97	.99	
No cut-off	-.71	-.70	.42	-.52	.81	.71	
QS							12.00*
Violate	.35**	-.17	-.14	-.09	.27*	-.22	
No hormone treatment cut-off	.36*	.06	.05	-.57***	.43*	-.33*	24.7***
Male	-.23*	.07	.00	.28*	-.18	.06	7.43
Age	-.01	.01	.01	-.02*	.01	.01	7.78
Income	.07**	-.03	-.02	-.04	.06*	-.04	10.81
LL = -3098.63, BIC(LL) = 6955.62, pseudo-R^2 =.60, Class.err.=.05							

Note: *p<0.05; **p<0.01; ***p<0.001

Table 6. Attribute importance

	Involved	*Country of origin*	*Least involved*	*Price sensitive Young, male,*	*Deliberate*	*Price sensitive*	*Weighted average*
Size	24%	17%	16%	16%	15%	12%	
Country	**21%**	**61%**	**49%**	**10%**	**45%**	**15%**	**22%**
Price	9%	**10%**	6%	**48%**	**15%**	**55%**	**21%**
Hormone	**18%**	5%	2%	9%	**26%**	8%	2%
QS	8%	2%	1%	0%	4%	8%	6%
Gourmet	4%	2%	2%	2%	4%	3%	1%
No choice	**39%**	**21%**	**40%**	**29%**	6%	**11%**	**48%**
							100%

Discussion and conclusion

The main goal of this research project was to characterize consumers with respect to their utilization of cut-off levels and the role of product involvement. We conducted an online choice experiment with visual shelf simulation of beef as a product with varying levels of involvement.

Our results show that compared to many other food products, price is not the most important factor for beef choice (Lim, Hu, Maynard, & Goddard, 2013). Even for the least involved consumers we find that country of origin is more important than price as long as price remains under a certain limit. The other labels on the product were contributed to utility but were of less importance than the country attribute. If participants stated to use one of the labels as cut-off criterion, they violated this cut-off at least once during the choice task, obviously because these were not as important as country of origin or price. Interestingly hormone treatment was ranked to be of least importance prior to the choice task by both involvement groups but turned out to explain a considerable amount of variance in the choice experiment. It seems that adding the label raised awareness and generated more choice in favour of the labelled product, despite the fact that European beef is free of hormone treatment in general. This shows the strength of labelling activities for issues that are relevant to consumer concerns.

With regard to involvement our results are somewhat ambiguous and deserve further elaboration. We find segments with high and low involved participants, suggesting that as expected beef is a product with varying levels of involvement, but we cannot explain cut-off

value existence and use solely with the level of involvement. A clear pattern, which has been observed in previous research, exists in the way that more involved consumers state to have more cut-off criteria. Our most involved class 1 has several cut-off criteria and at least with respect to country of origin, is less likely to violate those. The least involved class 3 does not seem to have cut-off levels and therefore also does not violate any. In between these high and low anchors of involvement the relation to cut-off level is less clear. Class 5 for example, seems to be even more deliberate than the highly involved class 1, since they seem not to have clear cut-off criteria for country but include several countries in their consideration set. Since country is the most important attribute for this class, allowing for different levels should lead to a more elaborate decision strategy, without claiming to be more involved. Class 4 on the other hand does not differ significantly from the other classes with respect to involvement but seems to have a strict cut-off criterion for country of origin, which is not violated. Thus, it seems that we do see a pattern of either not even having a cut-off criterion and not being involved at all to being highly involved with strict choice patterns. In between we can find a segment with only one strict cut-off criterion, which one would intuitively associate with low involvement and a more deliberate class, suggesting high involvement - which is however not reflected in significant differences with regard to involvement. Whether another consumer characteristic such as attitude or motivation could contribute to explaining the role of involvement and cut-off criteria or whether this is due to the cut-off level elicitation or choice task (Moser & Raffaelli, 2014) remains an issue for future research.

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