SEGMENTATION BASED ON CONSUMERS' PERCEIVED IMPORTANCE AND ATTITUDE TOWARD FARM ANIMAL WELFARE*

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Introduction

Animal welfare in general, and more specifically in livestock production, has become a major issue of interest, not only among direct interest groups involved in the food production chain, such as producers, retailers, government and consumers, but also in a wide variety of scientific research disciplines. This tendency of a general increased interest in animal welfare can be explained to a large extent by the prosperity level in the Western society (Seamer 1998). Food supply has largely exceeded food demand, which has turned markets into demand-driven economies where the goal of exchange and marketing is to better meet consumers' needs, demands and preferences. Together with the growing influence of post-materialistic values – of which interest in farm animal welfare is just one example – on product attribute evaluation and food choice decision-making, this has recently led to numerous studies about public and citizen concerns on the one hand (Verbeke 2002; Kanis, Groen, and De Greef 2003; Boogaard, Oosting, and Bock 2006; Lassen, Sandoe, and Forkman 2006; Maria, 2006; Van Poucke et al. 2006), and consumer attitudes and behaviour in relation with farm animal welfare on the other hand (Harper and Henson 2001; European Commission 2005; Frewer et al. 2005; Vanhonacker et al. 2006). This research focus was anticipated by Verbeke and Viaene (1999), who concluded, based on the analysis of a 1998 consumer sample in Flanders, that animal welfare and acceptable production methods emerged as key attention points for the future of livestock production and marketing, as well as public and consumer acceptance of animal-based food products.

However, the interpretation of the concept of farm animal welfare differs considerably between different interest and stakeholder groups, and its conceptualisation is heavily influenced by convictions (*opinions about the way things are*), values (*opinions about the way things should be*), norms (*translations of these values into rules of conduct*), knowledge (*constructed from experiences, facts, stories,*

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and impressions) and interests (*economic, social and moral interests*) (Te Velde et al. 2002). This framework explains why the livestock production and processing sector and the broader public tend to speak different languages when talking about animal welfare (Vanhonacker et al. 2007). Producers tend to position themselves as knowledgeable and rational actors, while they dismiss the concerns of the lay person as emotional and uninformed. The public, however, often associates the industry's interest in animal welfare as strictly economic and profit oriented, and view their own citizen and consumer viewpoint as ethically motivated (Kendall et al. 2006).

Public attitude toward animal welfare

Also within the broader public, diverse opinions appear. Despite the occurrence of differing opinions and the relevance of the topic, little research has focussed thus far on a conceptual approach to determinants of public or consumer attitudes to animal welfare. Kendall et al. (2006) aimed at filling this gap and built a theoretical framework on an extension of existing literature in sociology, mainly stemming from American studies. Many of the determinants described in their study were compatible with determinants discussed in European literature. Kendall et al. (2006) distinguished three sets of factors as structural determinants for attitudes about animal welfare: (1) place-based urban-rural factors; (2) other social structural factors; and (3) individuals' unique animal-related experiences. With regard to the first set, utilitarian motives were used to hypothesize a lower concern about animal welfare among persons with a rural background and/or experience with farming. This was confirmed by Verhue and Verzeijden (2003) and Frewer et al. (2005), who found that people living in rural neighbourhoods evaluated the state of animal welfare more positively.

The second set of factors was comprised of gender, socio-economic class, age and family status. Women expressed a higher concern with animal welfare as compared to men. The task of women as primary family caretakers, and as being more likely to engage in household tasks that put them in contact with animals, like caring for pets and preparing food, were considered as possible explanations for this gender difference. Similar conclusions are found by Burrel and Vrieze (2003) and Verhue and Verzeijden (2003). Next, lower income categories and less educated persons were hypothesized to express a greater concern for animals, which has also been referred to as the underdog-hypothesis (Kendall et al., 2006). Opposite results were found by Burrel and Vrieze (2003) and Verhue and Verzeijden (2003), where especially higher educated people expressed a higher concern for animal welfare. Further, age was hypothesized to be inversely related to the concern for animal welfare and to be related to one's life-cycle stage, hence subject to a change over time depending on the evolution and change of factors in a person's direct social environment, such as family relations (Kendall et al. 2006). Verhue and Verzeijden (2003) confirmed this hypothesis indicating a higher concern toward animal welfare among younger people. Finally, with regard to family status, expectations were that people with dependent children would express less concern about animal welfare, since they have to attribute time and energy toward their own offspring instead of to nonhuman others.

With regard to the individuals' experiences, a positive relationship with concern for animal welfare is hypothesized for people who do not hunt, have a pet, are vegetarian, are more involved in cooking and food shopping, and have higher concerns about the environment and food in general. With regard to vegetarianism, the

hypothesis was grounded on the worldview accompanying vegetarianism, which encompasses greater awareness of the origin of one's food (McDonald 2000).

Animal welfare related consumer behaviour

At present, there is a lack of studies that combine the citizen and the consumer perspective on farm animal welfare, i.e. studies that consider both variations in citizen attitude toward animal welfare on the one hand, and variations in the impact of animal welfare as a product attribute on consumers' food choice decisions on the other hand. Such studies are relevant because the market for high welfare products is rapidly evolving, due to some contemporary changing food patterns. Increased disposable incomes have caused that food shoppers in many markets can afford to pay premium prices for differentiated quality products. As a result, food has begun to provide an emotional as well as a functional role in consumers' lives. At the same time, consumer confidence in food production has dropped due to some consecutive food scares in Europe at the end of the nineties, in particular within the livestock production chain. Furthermore, consumers are increasingly aware of the association between food intake or their dietary behaviour, and their personal health and overall well-being, with consumers believing that food produced in a more natural way will suit them better and provide them with more benefits (Grunert et al. 2000). Considering these tendencies, a higher willingness to pay for high welfare products can be assumed. However, many studies have criticised claimed consumer willingness to pay, referring to the duality between consumers and citizen (Korthals 2001; Bennett, Anderson, and Blaney 2002; Carlsson, Frykblom, and Lagerkvist 2004; Liljenstolpe 2005). Individuals tend to respond to questionnaires as citizens and in this role, they claim to pay more attention to animal welfare. However, when they make a choice in the outlet as a consumer, they turn out not to be equally willing to pay for more animal friendly products (Aarts and Te Velde 2001). Moreover, animal welfare is an ethical issue, and as a consequence highly sensitive to social desirable answering, for example in survey research and interview questionnaires. As a consequence, some deduced that consumers do not prioritise animal welfare considerations while shopping for food. Such conclusions, however, may be too general and based on sample average scores, without acknowledging for different segments that might exist. Only few studies noticed the existence of a specific segment taking animal welfare more into account when shopping. For example, Grunert et al. (2004) stressed the potential market opportunities related to animal welfare for consumer-oriented product development.

More specifically, little information is available with respect to the segmentation of individuals based on their perceived importance of animal welfare when purchasing food in general (thus in their role as a consumer), and to our knowledge the segmentation of individuals based on the relative importance attached to animal welfare when purchasing food has not yet been studied in depth. Hansman (1999) found four consumer segments based on general food consumption patterns: the 'cooperating consumer', with a traditional food pattern; the 'responsible consumer', who feels highly responsible for the environment, health and animal welfare, and has mainly a vegetarian and ecological consumption pattern; the 'competitive consumer', who likes to eat exclusive; and the 'rational consumer', who is considered as a mainstreamer as he/she cannot be differentiated from other consumers. Meuwissen and van der Lans (2004) identified six consumer segments in The Netherlands: Environmentalists, Ecologists, Animal Friends, Health Concerned, Unpronounced and Economists. Both studies

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clearly show that market segments exist that take into account animal welfare to different degrees when purchasing food. In the latter study, Ecologists, Animal Friends and Health Concerned reported a significantly higher willingness to pay for pork produced with attention to animal welfare. Together with the Environmentalists, these segments scored animal welfare as a top three product attribute.

Scope and Objectives

The aim of our study is to perform a segmentation, based on the two topics discussed above: i.e. public attitude toward farm animal welfare, in relation to livestock production in Flanders, Belgium, and consumers' relative importance attached to farm animal welfare as a product attribute during food purchasing decisions. The contribution of this approach is two-folded. On the one hand, positioning different segments based on those two dimensions can help to better understand different viewpoints within society (the citizen-consumer duality), yielding a valuable basis to improve the societal (public and market-related) debate about the issue. On the other hand, segmentation is a necessary tool in order to understand how to make higher welfare foods relevant to different consumers and how to position these products in a competitive marketing environment. From this angle, distinct consumer profiles can be established which can provide insights as to how to target, communicate and convince these distinct groups to purchase higher welfare products. We will use attitude toward animal welfare as an indicator for the market opportunities of high welfare products, while the relative importance of animal welfare as a product attribute will be considered as the leverage or selling proposition for how to promote and communicate these products. The strength of this segmentation exercise is that it combines a rather concrete consumer-related measure (relative importance attached to farm animal welfare as a product attribute) with a more abstract public opinion (attitude toward animal welfare). These results should provide a more balanced picture with respect to the existence of socially and ethically engaged segments, integrating both evaluations from a public and a consumer perspective.

Materials and Methods

Sample and procedure

Survey data were collected through self-administered questionnaires during April 2006 in Flanders. A quota sampling procedure with gender, age, living environment (rural versus urban) and province as quota control characteristics was applied. Respondents were selected in a first phase through a wave of web-based questionnaires and supplemented with a more targeted distribution of paper questionnaires to ensure that the predetermined quota were approximated.

The total sample consisted of 459 respondents (Table 1). With respect to gender, we found a representative distribution. The age of the respondents ranged from 18 to 75 years, with an average age of 37.8 years (SD = 14.8), which is somewhat below the population's average age (40.2 years). Concerning living environment, we strived for a 35/65 ratio urban/rural, but a small over-representation of urban respondents was sampled. Finally, a small over-sampling of the provinces West- and East-Flanders (resp. + 6.2% and + 4.7%) appeared at the expense of Antwerp and Limburg (resp. – 5.9% and – 4.6%) (NIS, 2004). With regard to family status and education as external control variables, the sample family size approached the distribution in the population,

notwithstanding a somewhat higher share of households without children and an over-sampling of higher educated people.

Table 1. Socio-demographic characteristics of the sample (n=459); quota control variables are compared to the characteristics of the Flemish population (source: NIS, 2002)

	Sample	Population		Sample	Population
Gender (%)			**Education (%)**		
Male	48.5	49.3	≤ 18 years	32.3	
Female	51.5	50.7	> 18 years	67.7	
Age			**Living environment (%)**		
18 to 23 years	18.8	11.4	Urban	38.9	35.0
24 to 37 years	32.4	26.6	Rural	61.1	65.0
38 to 53 years	31.7	44.2			
> 53 years	17.1	17.8	**Region (%)**		
Mean (years)	37.8	40.2	West-Flanders	25.2	19.0
(S.D.)	(14.1)		East-Flanders	27.5	23.0
			Antwerp	21.7	27.7
Family size			Limburg	8.9	13.3
1 or 2 persons	52.5		Flemish Brabant	16.8	17.0
3 or 4 persons	32.7				
5 or + persons	14.8				

Measurement of constructs

First, 13 product attributes were probed for their perceived importance (PI) in the food purchasing decision process of animal food products on a five-point interval scale ranging from "totally unimportant" to "very important". The product attributes were: safety, quality, reliability, taste, origin, health, price, appearance, freshness, environmental friendliness, availability, animal welfare, and production method. PI reflects the individuals' reaction from a consumer perspective, i.e. someone who has to weigh and evaluate different product attributes before coming to a purchase decision.

Second, respondent's attitude was measured in terms of evaluative belief with respect to the current state of animal welfare in Flemish livestock production (EV). Therefore the statement: "*Do you believe the current state of farm animal welfare in Flanders in general is…"* was used. This item was measured on a seven-point interval scale anchored at the left pole by "very poor" and at the right pole by "very good", with "moderate" as the mid-point of the scale. This second measure is much more a public opinion, which is presumed to be held rather independent of the consumption decisions.

Third, consumption of beef, pork, poultry, fish and meat substitutes was scored on a six-point self-reported consumption frequency scale, ranging from "daily" to "never".

Fourth, both subjective and objective knowledge about farm animal welfare were probed. Subjective knowledge was assessed using four relevant items of the five-item scale described by Flynn and Goldsmith (1999) and measured on a five-point Likert-scale. Items were: "*Compared to an average person, I know a lot about animal welfare"; "I have a lot of knowledge about how to evaluate the welfare of farm animals"; "I have a lot of knowledge about how farm animals are kept"; "My friends consider me as an expert on farm animal welfare."* Objective knowledge was investigated using five statements, corresponding with the major five groups of farm animals in Flanders: "*Barn eggs are from chicken that have outdoor access" (not*

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correct); "Male pigs are castrated because otherwise the meat can have a bad smell" (correct); "Broilers are slaughtered at the age of 4 months" (not correct); "A dairy cow gives milk only after calving" (correct); "Double-muscled beef cattle mostly calve via a Caesarian section" (correct). Respondents could either agree or disagree with each statement. To account for guessing, respondents were also asked to indicate how confident they were about their answer to each item on a scale from 1 (*very uncertain*) to 5 (*very certain*).

Fifth, consumer opinions toward information related to farm animal welfare were assessed using six statements, each scored on a five-point Likert-scale. Statements were: *"Labels should indicate more clearly the rearing conditions of the animals"; "Information about animal welfare is too little available"; "Animal welfare should be controlled more severely"; "Animal welfare should be guaranteed through a label on the product"; "I'm willing to pay more for food produced with more attention to animal welfare"; "More information about animal welfare would influence my meat consumption".*

Sixth, variables representing the three sets of structural determinants for the attitude toward animal welfare as described by Kendall et al. (2006) were included. The place-based factors were represented by living environment and farm experiences. Respondents were asked in what type of place they live (rural or urban). The response is coded 1/0 and is based on individuals' self-identification. To tap experience with farming, respondents were probed with the following statements on which they could answer 'yes' or 'no': "I have / my parents have a farm"; "My grandparents / other relatives have a farm"; "Close neighbours / good acquaintances have a farm". Other structural factors involve gender, age, education, and presence of children. Finally, being a vegetarian (yes/no) was included as variable measuring individuals' animal-related experience.

Analyses procedures

Data were analysed using SPSS 12.0. First, hierarchical clustering with Ward's Method as cluster method, and K-means cluster analysis were performed to obtain segments. Bivariate analyses including cross-tabulation with Chi²-statisitics, Independent Samples T-test and One-Way ANOVA comparison of means were used to profile the clusters in terms of behaviour, knowledge, information opinions, and structural determinants for attitude toward animal welfare.

Given the high reliability coefficient of the four subjective knowledge items (Cronbach's alpha = 0.93), we calculated a summated subjective knowledge score corresponding with a score ranging from 4 to 20. Also with respect to objective knowledge, we computed a cumulative score. For each objective knowledge item, a wrong answer was coded as zero, while a correct answer was coded with its corresponding reported certainty level, i.e. ranging from one to five. As a result of this coding procedure and after summation across the five items, an overall range from zero to 25 was obtained for objective knowledge.

Results

Segmentation analysis

Segmentation variables

The first segmentation variable pertains to the perceived importance attached to animal welfare in the food purchasing decision-process. Since this perceived importance has little meaning in absolute terms, though only relative as compared to the perceived importance attached to other product attributes, a relative score was computed for each of the 13 attributes assessed by the respondents. This score, corresponding with the relative importance, was computed using (1):

$$RI_i = \frac{13 * PI_i}{\sum_{i=1}^{13} PI_i} \qquad \begin{array}{l} \text{RI = relative perceived importance} \\ \text{PI = absolute perceived importance} \end{array} \qquad (1)$$

A *RI*-score below the value of 1 indicates that the specific product attribute ranks among the less important product attributes, while a score above 1 corresponds with a relatively important product attribute. As the focus will be on the relative perceived importance of animal welfare, we will use the abbreviation RI_{AW} in further discussion as reference for the relative perceived importance score assigned to the attribute animal welfare. RI_{AW} ranges from 0.27 to 2.60 within the sample, with a mean score of 0.98 (SD=0.23).

The second segmentation variable is the respondent's attitude in terms of evaluation (belief) of the current state of animal welfare in Flemish livestock production (EV). EV ranges from 1 to 7 with a mean score of 4.13 (SD=1.49). For the clustering procedure, we have opted to work with the standardised score (z-score) of both variables rather than with the actual scores, in order to obtain a segmentation that better puts the relative position of the segments into perspective. In further discussion, *absolute perceived importance score* and evaluation of farm animal welfare in the current Flemish livestock production refer to the mean scores of the non-standardised variables RI_{AW} and EV.

Cluster analysis

A hierarchical clustering followed by a K-means cluster analysis was used to determine the optimal number of clusters (so-called segments) yielding the highest degree of differentiation. This resulted in a six-cluster solution (Table 2 and Figure 1).

Table 2. Profile of the segments on the segmentation variables (n=459)

	S1	S2	S3	S4	S5	S6
Segment size (% of sample)	21.1	12.9	18.7	12.6	23.5	11.1
Absolute perceived importance (PI)	4.14	2.51	3.15	3.95	4.55	4.98
Relative importance (RI_{AW})	1.03	0.66	0.81	0.95	1.12	1.30
RI z-score (segmentation variable)	0.22	-1.40	-0.75	-0.15	0.59	1.39
Evaluation (EV)	5.44	5.95	4.53	2.36	3.76	1.67
EV z-score (segmentation variable)	0.88	1.22	0.26	-1.18	-0.24	-1.65

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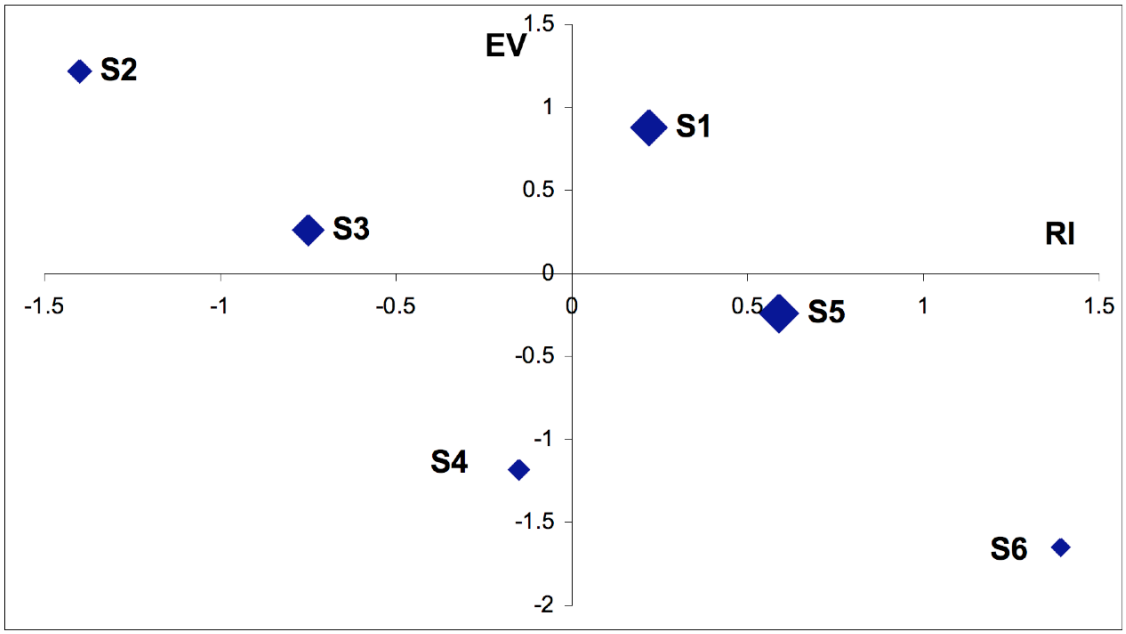
Figure 1. Mapping of the cluster centres according to relative importance (RI z-score) and evaluation (EV z-score) of farm animal welfare; the size of markers reflects cluster size.



Segment 1 (S1; 21.1% of the sample) corresponds to respondents who attached high absolute importance to animal welfare when purchasing animal food products. However, all product attributes received a high perceived importance score among these consumers. As a consequence, their RI_{AW} is rather neutral, thus animal welfare is considered moderately important compared to other product attributes. Nonetheless, animal welfare received a higher importance than some other production system-related attributes, such as production method and environmental friendliness. With respect to their evaluation of farm animal welfare in the current Flemish livestock production, an above average EV was found ("rather good" to "good") (Table 2).

Segment 2 (S2; 12.9% of the sample) corresponds to respondents who claim not to take animal welfare into account in their food purchasing decision-making, given that no other product attribute received a lower *RI*-score than the attribute animal welfare. Their most important product attributes when purchasing animal food products were freshness, quality and taste. Also, people belonging to S2 reported the most positive EV.

Respondents belonging to Segment 3 (S3; 18.7% of the sample) showed a lot of similarities with S2 regarding the absolute perceived importance of the product attributes. However, their opinion is not that sharply pronounced, meaning that a similar ranking occurred, with smaller differences between the relative scores. Moreover, in contrast to the very positive EV given by S2, S3 is somewhat less positive, evaluating animal welfare mainly as "moderate" to "rather good".

Next, Segment 4 (S4; 12.6% of the sample) mirrors S1 in terms of the standardised RI_{AW} and EV (Figure 1). Similar as for S1, high perceived importance scores are attached to all product attributes. However, respondents belonging to S4 attribute less importance to animal welfare as compared to environmental friendliness and production method.

Segment 5 (S5; 23.5% of the sample) is the largest segment and is composed of respondents who indicate to take animal welfare quite heavily into account, i.e. to the same extent as quality and health attributes, and even to a higher extent than taste and safety. With respect to EV, a rather average score was found. This segment mirrors S3 with respect to the segmentation variables (Figure 1).

Finally, Segment 6 (S6; 11.1% of the sample) is very concerned about animal welfare, as is expressed first in a very high PI of animal welfare and second in a very poor EV. Animal welfare emerged as the most important product attribute, followed by the two other production system-related attributes, and outweighing the quality traits and taste. Moreover, product appearance, availability and price are relatively considered as much less important among S6-members as compared to the other segments.

Profiling of the clusters

Determinants of animal welfare perception

Table 3 presents a set of variables within the three sets of determinants of public attitude toward animal welfare as described by Kendal et al. (2006). First, with regard to the place-related variables, we found no significant differences between the segments related to living environment, although S1 and S2 were composed of the highest amount of rural inhabitants. Living environment is not associated with RI_{AW} (T=0.86, p=0.39), while we found a marginal influence on EV (T=1.79, p=0.074), with a more positive evaluation of current farm animal welfare given by rural inhabitants ($Mean_{urban}$=3.97; $Mean_{rural}$=4.22). Concerning farming experience, we found pronounced differences. The respondents who have themselves a farm or have parents with a farm are distributed over S1, S2 and S3, with the highest relative share corresponding to S2 (21,6%) (Chi^2=43.09, p<0.001). Segment 1 also includes a relatively large share (13.3%) of respondents whose grandparents or other relatives have a farm (Chi^2=14.98, p<0.01). The percentage of close neighbours or good acquaintances having a farm does not differ significantly between the segments (X^2=9.18, p=0.102). Ownership of a farm or parents having a farm has its consequences with regard to RI_{AW} and EV: a significant lower RI_{AW} (T=3.65, p<0.001) and a more positive EV (T=10.95, p<0.001) appeared among respondents with the highest farming experience. Conversely, a lower degree of farming experience did not longer impact RI_{AW} (p>0.1), while it still showed a significantly positive relationship with EV (p<0.1).

Second, we included gender, age, education level and the presence of children as other social structural variables. For gender, significantly more men belong to S2 (Chi^2=39.55, p < 0.001), whereas women rather belong to the S5 and S6. In general, we found that females (Mean=1.03) attached more importance to animal welfare relative to other product characteristics as compared to men (Mean=0.93) (T=4.44, p<0.001) and that they evaluate the current state of animal welfare as more negative ($Mean_{male}$=4.45, $Mean_{female}$=3.82; T=4.59, p<0.001). Also for age, we could make a significant distinction between the segments (Chi^2=36.59, p<0.001). Segment 1 is composed of a relatively low amount of people aged between 24 and 37, while we found an over-representation of the two oldest age categories. A similar age distribution appeared for S2, although deviations from the distribution in the total sample were smaller as compared to S1. Segment 3 is characterised by a rather low amount of youngsters, while S4 consists of a large group of respondents aged between 24 and 37. Finally, S5 does not show large deviation from the samples' age distribution, whereas S6 has an over-

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representation of the two youngest age categories. We discovered no age-effect on RI_{AW} (F=0.96, p=0.41), while EV was clearly age-dependent (F=8.13, p<0.001). The second age category expressed the lowest evaluation, significantly different from the two oldest groups. The remaining three categories do not differ significantly from each other. Furthermore, education level does not differ between the six segments (Chi²=2.73, p=0.74), and did not associate with neither RI_{AW} (T=0.0.239, p=0.811) nor EV (T=0.998, p=0.319). Finally, between-segment differences appeared for the presence of children in the household (Chi²=36.31, p<0.01). We saw the highest share of households with children for S1 and S2, while within S6, only one fifth of the households had children. No association of the presence of children was found with any of the segmentation variables (p>0.1).

Table 3. Determinants of animal welfare for the different segments (n=429), frequency distributions (%); total sample characteristics are mentioned between brackets

	Sample	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**
Place (% yes)							
Urban	(38.9)	33.7	30.5	46.4	41.4	38.9	43.1
I / parents have a farm	(6.1)	13.3	21.6	3.7	0	0	0
Grandparents / other family have a farm	(29.1)	43.2	35.2	21.3	28.6	21.4	26.5
Close neighbours / good acquaintances have farm	(40.1)	50	48.2	30.9	38.9	35.0	40.8
Social Structural Location (% yes)							
Male	(48.5)	54.2	82.5	44.0	48.3	36.1	33.1
Age <24	(18.8)	17.7	18.6	12.9	20.7	21.3	23.5
Age 24-37	(32.4)	15.6	25.4	36.5	39.7	36.1	49.0
Age 38-53	(31.7)	38.5	32.2	35.3	27.6	31.5	17.6
Age 54+	(17.1)	28.1	23.7	15.3	12.1	11.1	9.8
Mean age (years)	(37.8)	42.5	41.0	37.4	35.2	36.0	32.6
Higher education	(67.7)	63.2	67.8	67.9	74.1	65.7	72.5
Presence of children	(48.9)	63.2	66.1	52.4	38.6	43.5	19.6
Individual Experience							
Vegetarian (% yes)	(12.2)	0	0	2.4	21.1	9.4	62.0

Third, we included vegetarianism as a single-item within the set of individual experiences. Where we found almost no vegetarians in S1, S2 and S3, the majority of respondents within S6 (60%) indicated to be vegetarian. S4 and S5 were positioned in between, with respectively about 20% and 10% being vegetarian. Consequently, this difference in segment composition was significant (Chi²=148.86, p<0.01). Also, we noticed a highly significant association of vegetarianism was found with both segmentation variables (p<0.1).

Meat and meat substitute consumption

Differences in claimed consumption behaviour between the segments are clearly reflected in their reported consumption frequency of meat, fish and meat substitutes (Table 4). With claiming to eat meat mostly every day, the segments S1, S2 and S3 appeared as the heaviest meat consumers. Segment 6 on the other hand reported a very low meat consumption frequency, while S4 and S5 indicated a meat consumption frequency in between these two extremes. Reported fish consumption frequency, was lower for S6 as compared to the other segments. Consumption frequency of meat

substitutes was the inverse of the meat consumption frequency, with a very regular consumption of meat substitutes in S6 and a very low consumption frequency by S1, S2 and S3.

Table 4. Profiling of the segments based on meat and meat substitute consumption frequency; mean scores

	S1	S2	S3	S4	S5	S6	Sample
Consumption frequency[$]							
Beef	2.51a	2.61a,b	3.01b,c	3.64c	3.29c	4.98d	3.22
Pork	2.61a	2.59a	2.92a,b	3.81c	3.40b,c	4.90d	3.25
Poultry	2.91a	2.72a	2.89a	3.63b	3.40b	5.00c	3.32
Fish	3.34a	3.39a	3.23a	3.42a	3.24a	4.31b	3.42
Other meat substitute	5.18c	5.35c	5.07c	3.96b	4.37b	2.69a	4.55

[$]: Six-point frequency scale: 1 = every day; 2 = several times a week; 3 = weekly; 4 = monthly; 5 = less than monthly; 6 = never ; different letters (a-b-c) indicate significantly different average scores using ANOVA and BONFERRONI post-hoc test

Knowledge

The level of both subjective and objective knowledge about livestock production practices correlates quite well and is not equal among the six segments (F=10.89, $p<0.001$; F=5.21, $p<0.001$, respectively). S6 and S2 reported the highest subjective knowledge about farm animal welfare. S3 on the other hand indicated the lowest subjective knowledge, and all other segments did not differ significantly from each other (Table 5). In line with the reported subjective knowledge, S6 and S2 turned out to be also effectively the most knowledgeable about animal welfare issues based on the objective knowledge score (Table 5). S3, S4 and S5 were the least knowledgeable.

Information variables

The different segments show clear differences with regard to the evaluation of the current information about animal welfare, the expectation they have about animal welfare information and the stated impact of information on their behaviour. The lowest score for each of these issues was given by people belonging to S2. With regard to the first four information items as they are presented in Table 5, a neutral average segment score was found within S2. This indicates that they are not against a more intensive and more clear information provision, but that they are also not explicitly asking for more information. The difference with the other segments was the largest with respect to the attitude toward more severe controls on animal welfare. The low interest in information is also reflected in a very low expected impact of receiving more information on their meat consumption. Furthermore, S2 was the only segment which disagreed to pay more for food produced with more attention for animal welfare.

S1 and S3 are somewhat more positive toward the information statements. They score neutral (mean value approaching the value of 4) on the statements related to more and clearer information provision and on more severe controls. Somewhat contradictory with this request is their neutral attitude toward the expected impact of more information on their meat consumption and the limited willingness to pay for food produced with specific attention for animal welfare. Probably, this could be driven by their daily consumption of meat.

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Table 5. Profiling of the segments based on knowledge and information variables

	S1	S2	S3	S4	S5	S6	Sample
Knowledge							
Subjective	12.4b	13.1b,c	10.2a	11.2a,b	11.3a,b	15.5c	12.02
Objective	12.7a,b	14.7b	10.7a	10.2a	10.6a	14.2b	11.97
Information statements							
Labels should indicate more clearly the rearing conditions	3.89b	3.17a	3.78b	4.43c	4.34c	4.82d	4.05
Information is too less available	3.85b	3.08a	3.92b	4.40c	4.38c	4.44c	4.02
Animal welfare should be controlled more severely	3.84b	2.81a	3.99b	4.57c	4.55c	4.94d	4.12
Animal welfare should be guaranteed by a label	4.00b,c	3.19a	3.78a,b	4.47c,d	4.51d	4.86e	4.13
I am willing to pay for products with more animal welfare	3.56b	2.32a	3.21b	4.19c	4.32c	4.78d	4.73
More information about animal welfare would influence my choice	2.93b	2.08a	2.95b	3.60b,c	3.78c	3.63b,c	3.19

Different letters (a-b-c-d-e) indicate significantly different average scores on five-point scales using ANOVA and BONFERRONI post-hoc test

In contrast, the remaining segments (S4, S5 and S6) expressed a high need for more and clearer information and for more severe controls on animal welfare. While this need is high for S4 and S5, it is extremely high for S6. Despite this strong request for information, only a moderate expected impact of receiving more information on the meat consumption is indicated by these segments. Explanations pertain to a segment being largely vegetarian (S6), hence not willing to eat meat whatever the amount of information provided, or to segments consuming already a large amount of meat (S4, S5), hence hardly leaving room for further increase. Regarding willingness to pay, we found a high score corresponding with S4 and S5 and a very high score for S6. Especially concerning S6, this high willingness to pay is in line with the low perceived importance of price in the food buying decision process.

Conclusion

Driven by several socio-economic evolutions, animal welfare has gradually come to the forefront in recent societal debates. Despite the fact that animal welfare is subject to an increasing amount of research, theoretical development and empirical evidence related to the topic within sociology and consumer science research is rather limited and often focused on the description of findings on a general population level. However, opinions related to animal welfare are very divided and often conflicting. Moreover, seen the ethical character of animal welfare, public opinion or reflections from a citizen perspective do not provide a straightforward picture that is relevant for actual consumer behaviour and food choice. A gap in literature exists with respect to combining public citizen-oriented measures as well as consumer-oriented approaches.

In this paper, we start from the conceptual approach presented by Kendall et al. (2006), which aimed at fostering the sociological debate about attitudes toward animal welfare. With the performed segmentation analysis, we provided insights in the existence of different population groups or segments, who fuel the debate starting from

a different and often conflicting perspective, and second, we identified specific market opportunities for high welfare products associated with compatible marketing strategies.

We achieved a six-cluster solution. Seen the resulting characterisation of the segments in terms of structural determinants of animal welfare; of consumption frequency of meat and meat substitutes; of knowledge about animal welfare; and of attitude toward information about animal welfare, we could basically interpret the six segments as four groups with very distinct features. S2 and S6 appeared as two extreme groups that stand on their own, and that have a completely opposite attitude and belief structure in relation with farm animal welfare as well as a very opposed consumption behaviour pattern. The remaining two groups could be composed through a combination of two segments: S4 and S5, and S1 and S3, respectively. With regard to their features, they are positioned in between the two extreme groups, with S4/S5 rather tending to S6, and S1/S3 rather tending to S2.

Along the axis of the attitudes toward animal welfare, the characteristics of the different groups largely corresponded with the set of determinants defined by Kendall et al. (2006) as affecting the attitude toward animal welfare. With regard to S2, especially the highest degree of farming experience and a high share of rural inhabitants, together with the predominantly male composition seemed to explain the very low concern about the current state of farm animal welfare. S6 on the other hand, which expressed the highest concern toward farm animal welfare, differed most strongly from the other segments in terms of the share of vegetarians (highest), their age profile (youngest) and the share of households with children (lowest). All these characteristics were described as determinants for a higher concern toward animal welfare. The perspectives of S2 and S6 toward farm animal welfare are strongly opposed, most likely because of their different type of involvement with animal welfare. S2 is mainly socio-economically involved with agriculture and livestock production, in the sense that farming activities are a part of their daily lives and a source of livelihood in their living environment. S6 is mainly involved with animal welfare because of personal moral and ethical considerations. Both segments display a very consistent attitude-value profile (as individual in their role as a citizen or member of a particular societal group), and behavioural profile (as individual in their role as consumer, thus with respect to food choices). Most likely, the societal debate about farm animal welfare will continue to be fuelled mainly by those two societal groups with opposing interests. The position of the other segments is bridging between these two extremes with regard to Kendall et al's. (2006) determinants. Depending on the strength of arguments in the debate, through new personal experiences, changes in their social and living environment, and exposure to information, these segments may evolve over time in either direction. Hence, from a communication point of view, these segments are particularly interesting as target audiences because of their rather moderate predisposition toward farm animal welfare.

The segmentation exercise is especially valuable with regard to identifying market opportunities and formulating marketing strategies for high welfare products for each of the groups. An increased market opportunity for high welfare products is assumed with an increased concern for the current state of animal welfare. As a result, we see little or no animal welfare-related marketing possibilities for people belonging to S2, who are very positive toward the current state of animal welfare. In addition, they indicate a very low importance for animal welfare as a product attribute in their food purchasing process. Their low expressed information need and willingness to pay

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corroborate with this. The group composed of S1 and S3 are also considered as a group with rather low marketing opportunities for high welfare products. Seen their modest willingness to pay and information need, together with animal welfare not being ranked as a very important product attribute, high welfare products will need very strong tangible benefits (e.g. taste, tenderness, …) without high price premiums for eventual market success with these segments.

Next, the group composed of S4 and S5 can be considered as a real marketing opportunity segment. This group reports concerns about animal welfare and does not neglect animal welfare as a product attribute in the food purchasing decision process. Moreover, they express high information needs and willingness to pay for higher welfare products. This group comprises 36.1% of the sample, hence constituting a considerable market. Within this group, animal welfare is important but not the top priority. Consequently, we do not expect a very strong commitment in terms of behaviour, i.e. people may not consistently buy high welfare products each time. Seen the importance attached to animal welfare and the concern toward it, it will be important from a marketing point of view, to do efforts in order to better match behaviour with attitude within this segment. Possible strategies pertain to stimulating awareness; a strong focus on associations of high welfare products with for instance a better taste or with benefits in terms of health and safety; and stimulation of trial purchases through free-samples and promotions.

Finally, S6 also yields clear marketing opportunities. Seen their limited size (11.1%) and about 60% of them being vegetarian, this group constitutes only a small market for meat and other livestock products. Notwithstanding the small size, this group has a very high commitment and a very high willingness to pay. To most effectively reach this niche market, products should strongly focus on high animal welfare standards, for example through clear and credible labels backed up by trustworthy control and traceability mechanisms, and personal reassurance.

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