Meat consumption patterns and intentions for change among Finnish consumers

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Abstract

During the past few decades, meat has increasingly become a subject of controversies relating to health and safety, environment, and animal welfare. Even though these changes in perceptions of meat are not yet visible in aggregate consumption figures, they can be observed in individual consumption patterns and as intentions to change the consumption. In this study, we examine changes in meat consumption among the Finnish consumers taking into account both stated changes in the past and intended changes in the future. Based on these changes, we identify consumer segments and investigate in which ways these segments differ from each other socio-demographically and with respect to current meat consumption and the stated reasons for the change. The latent class analysis based on representative Internet survey data revealed nine consumer clusters that formed three cluster blocks. The results showed that a large number of people, over 40%, had stabile consumption patterns. A cluster block of 14% of consumers had already shifted their consumer patterns to contain more vegetables and less meat. One third of the consumers were identified to be in the middle of the change with a general tendency to decrease the use of meat and increase the use of vegetables. Although, environmental effects of meat and animal welfare issues were important reasons for change in some clusters, healthiness was the most salient stated reason for change in consumption habits.

Introduction

Meat is a contested area of food production and consumption. Historically, meat has been a scarce and highly appreciated foodstuff, a source of energy and protein, and a palatable food carrying the images of strength, power and masculinity (Twigg 1983, Fiddes 1991). Even today, meat is an important part of Western food cultures, and is increasing its importance in other parts of the world, too. It has a central place in people's definitions of a 'proper meal' (Charles & Kerr 1986), and its importance is largely unquestioned in national nutrition recommendations (for Finland, see National Nutrition Council 2005). For many people, a meal without meat is a rare exception. However, during the past few decades, meat has increasingly become a subject of controversies relating to health and safety, environment, and animal welfare (Vinnari & Tapio 2009). In developed countries, the disputes on meat have encouraged changes in public understandings of meat, and these may in the long run contribute to changes both in total meat consumption and the use of meat from different animals. Even though these changes in perceptions of meat are not yet visible in aggregate consumption figures, they can be observed in individual consumption patterns and in intentions to change the meat consumption.

In much of previous research on consumer perspectives on meat, the focus has been on quality attributes and perceived quality (see, e.g., Verbeke & Viaene 1999, Glitsch 2000, McIlveen & Buchanan 2001, Grunert et al. 2004, Grunert 2006, Krystallis et al. 2007), as well as on perceptions of risks and safety of meat (e.g., Yeung & Morris 2001, Yeung & Yee 2002, Mahon & Cowan 2004, Verbeke & Vackier 2004, Korzen et al. 2011). The former field of studies has differentiated between expected quality and perceived quality (Glitsch 2000), between search, experience and credence quality attributes (e.g. Becker 2000), and between intrinsic and extrinsic cues (e.g. Glitsch 2000, Grunert et al. 2004, Grunert 2006) that consumers use when evaluating the quality of various meat types. Furthermore, the latter field focusing on risk perceptions has been particularly active since the several food scares in Europe in the late 1990's. Several studies have also analyzed consumer needs for meat labeling schemes assuring quality and safety (Bernués et al. 2003, Yeung & Yee 2003,

Loureiro & Umberger 2007). Compared to the expansive research in the past on consumer perceptions of quality and quality attributes of meat, there is relatively little research on factors that affect consumption and changes in consumption of meat.

The recent debate on the ethical and environmental aspects of meat production and consumption can be seen in new research questions arising in studies on consumer perspectives on meat. During the 2000's, consumer studies have increasingly focused on attitudes toward and importance of animal welfare issues (McEachern et al. 2002, European Commission 2005, Mayfield et al. 2007) and lay definitions of farm animal welfare (Skarstad et al. 2007, Vanhonacker et al. 2010). Interestingly, this perspective is reflected in the terminology referring to people as eaters of meat: they are now conceptualized not only as consumers but also as citizens or the public (e.g. Vanhonacker et al. 2007, Vanhonacker et al. 2010). The research focus has hence widened from an interest in consumer perceptions of the intrinsic qualities of meat to a new interest in consumers as part of the social, cultural and environmental processes and effects of meat production and consumption.

So far only few studies have explored how and to what extent people's expectations of meat and meat production turn into changes in consumption. Verbeke & Viaene (1999) concluded that in Belgium, particularly people whose top five important meat attributes included leanness of meat, said that they had reduced their meat consumption during the past year, and people who valued meat being free of hormones were most eager to reduce their consumption in the future. In a segmentation study of Belgian meat eaters, Verbeke & Vackier (2004) identified four consumer segments, 'straightforward meat lovers', 'cautious meat lovers', 'indifferent meat consumers' and 'concerned meat consumers', differing in their involvement in meat but also their safety and healthiness concerns as well as past and intended changes of meat consumption. These studies have indicated the heterogeneity in the changes of consumption patterns. However, the identification of consumer segments has not been based on the changes in patterns.

In this study, we take a different approach and examine changes in meat consumption among the Finnish consumers taking into account both stated changes in the past and intended changes in the future. Based on these changes, we identify consumer segments and investigate the ways in which these segments differ from each other socio-demographically and with respect to current meat consumption and the stated reasons for change. We bridge the identified gap between the attitudes and actual behavior (e.g., Verbeke et al. 2010) by focusing on the changes and the reasons behind these changes as identified by the consumers *themselves*. This approach avoids the problem of trying to make a link between values and attitudes that people hold and express as deliberative citizens, and the actual everyday choices they make as hurried consumers, often with multiple objectives to fulfill.

Material and methods

Data

The data used in this study were gathered in March 2010 with an online questionnaire of consumers representative of Finnish Internet users, who were from 18 to 79 years old. Of the consumers who were contacted, 38% finished the questionnaire, yielding 1623 complete answers. 14% of those who began answering dropped out before finishing the questionnaire.

The data were representative of the population regarding gender, residential province and occupational level. Some dissimilarity existed in the age structure, the respondents of the survey being older than the population in general. In addition, the educational background, the household size and the gross income of the households included some deviations from the population distributions. All in all, however, the comparability of the data to the population was at a reasonable level.

In the survey a set of questions dealt with past change in the consumption of beef, pork, chicken and vegetables. With a three-level scale the respondents expressed their perception on whether their own consumption had decreased, remained stable or increased in the past couple of years. The same three-level scale was used to measure the respondents' future consumption intentions regarding the same meat types and vegetables.

The meat eating frequency was based on several meat-type specific measures. The meat-types included beef, pork, chicken, game and mutton meat. Vegetarians comprised 0.7% of the sample, whereas 0.6% followed a special diet for religious reasons. Table 1 provides the distribution of the past and future changes in consumption and the current frequency of different food types as main courses.

After measuring the perceptions of consumption changes, the respondents were asked how much various reasons affected the change in consumption. The reasons for change were asked regarding both the past and the future consumption. A three-level scale (not at all, somewhat, much) was used to measure the magnitude of the significance of each reason. The alternative reasons for change were healthiness, environmental effects, safety, price or own economic situation, life situation, taste preferences, animal welfare, and weight control.

Table 1. The stated past and intended future changes in meat and vegetable consumption and the current consumption level.

	Share of consumers %		
	Have increased in the past	Will increase in the future	Currently more than once a week as a main course
Beef	6	3	55
Pork	4	2	53
Chicken	31	12	66
Vegetables	44	42	31

Statistical methods

To form the consumer clusters based on the past and future changes in food consumption the latent class method was applied. The idea of the latent class analysis is that behind the observed variables – in our case the statements concerning changes in food consumption – unobservable classes of individuals may exist, each having their own distribution of observed variables (Magidson & Vermut 2002). This means that each latent objective class of consumers will answer the measures differently, but homogenously within the class. The estimation of the latent class models relies on probabilities. In the estimation there are two goals: first, to estimate the probabilities for class membership, and second, to estimate the probabilities for the responses to the statements of food consumption given a certain class membership. The accuracy of the latent class analysis does not depend on the measurement scale. Measures can have a nominal or ordinal scale, and the scale and the variance can differ between measures.

The estimation of class membership can be based on only the statements concerning changes in food consumption, or on both, individual characteristics and the consumption measures. The probability of class membership is a function of responses to the consumption measures, x_i. The probability that an individual belonging to class *c* answers level *s* to question *q*, $\pi_{gs|c}$, is the basis of the latent-class model. In this study the individual characteristics are not included, and the log-likelihood that individual *i* belongs to class c obtains the form $\ln L = \sum_{i}^{N} \ln \left[\sum_{c=1}^{C} \Pr \prod_{q=1}^{Q} \prod_{s=1}^{S} \left(\pi_{qs|c} \right)^{X_{iqs}} \right]$.

The probabilities are estimated by maximizing the likelihood function in the state of incomplete prior information of class membership or response probabilities (Arcidiacono & Jones 2003). The estimation is carried out by assuming one class, then two classes, three classes and so on. The estimation based on maximising the likelihoods allows the assessment of the explanatory power of the model in each step to decide the optimal number of classes. For this purpose we used BIC and AIC information criteria, which are based on log-likelihood scores with correction factors for the number of observations and the number of parameters.

The first criterion for selection of the optimal number of clusters was the p-value. The p-value is calculated under the assumption that the L^2 statistic follows a chi-square distribution. For determining the best model, a p-value greater than 0.05 provides an adequate fit and the model which has the fewest number of parameters is chosen. Using these criteria, the best model was a 9-class model (p-value 0.4 and the number of parameters 88) (Table 2). The BIC and AIC information criteria were used to restrict the number of clusters to the 9-class instead of 10-class or 11-class models. By means of the 9-class model, the L^2 is reduced to 1547.76 which was 56% reduction from the baseline 1-class model.

Table 2. The results of fitting various LC-models.

Model Description	BIC(LL)	AIC(LL)	Npar	L^2	DF	p-value	% reduction in L^2 (H_0)
1-class	18 281.97	18 195.69	16	3 549.37	1607	6.30E-148	0
2-class	17 492.19	17 357.39	25	2 693.06	1598	4.30E-59	-24 %
3-class	17 091.48	16 908.15	34	2 225.82	1589	3.50E-24	-37 %
4-class	16 996.94	16 765.09	43	2 064.76	1580	1.60E-15	-42 %
5-class	16 935.27	16 654.88	52	1 936.56	1571	5.80E-10	-45 %
6-class	16 870.58	16 541.66	61	1 805.34	1562	1.60E-05	-49 %
7-class	16 860.72	16 483.28	70	1 728.96	1553	0.0011	-51 %
8-class	16 864.99	16 439.02	79	1 666.69	1544	0.015	-53 %
9-class	16 812.58	16 338.08	88	1 547.76	1535	0.40	-56 %
10-class	16 890.70	16 367.67	97	1 559.34	1526	0.27	-42 %
11-class	16 902.01	16 330.45	106	1 504.12	1517	0.59	-32 %

As the motivation for the consumption changes was not included in the latent class model, the analysis of variance was used to compare the motivations between the clusters.

Results

Based on the past changes and future intentions in meat and vegetable consumption, nine consumer classes were identified in the latent class analysis. Table 3 shows the cluster results of the

9-class solution. The solution provides diverse cluster sizes varying between 0.8% and 42.6%. The R^2-values indicate the share of explained variance by this 9-class model. The conditional probabilities show the difference in consumption patterns that distinguished the clusters.

Table 3. Profile description and parameter estimates for the 9-class model.

	Cl 1	**Cl 2**	**Cl 3**	**Cl 4**	**Cl 5**	**Cl 6**	**Cl 7**	**Cl 8**	**Cl 9**	**Wald**	**p-value**	**R^2**
Cluster blocks	*No change*	*Past change*		*Ongoing change*								
Cluster Size - %	42.6	12.4	1.5	10.1	9.6	9.0	7.6	6.3	0.8			
INDICATORS												
Past Change: Beef										216.02	0.000	0.44
consumption has decreased	0.07	0.60	0.93	0.20	0.54	0.79	0.69	0.00	0.00			
consumption has remained stable	0.89	0.40	0.07	0.79	0.46	0.21	0.31	0.57	0.32			
consumption has increased	0.05	0.00	0.00	0.01	0.00	0.00	0.00	0.43	0.68			
Past Change: Pork										98.80	0.000	0.49
consumption has decreased	0.03	0.67	0.99	0.02	0.55	0.00	0.59	0.83	0.48			
consumption has remained stable	0.94	0.33	0.01	0.93	0.45	0.80	0.41	0.17	0.52			
consumption increased	0.04	0.00	0.00	0.06	0.00	0.19	0.00	0.00	0.00			
Past Change: Chicken										209.80	0.000	0.36
consumption has decreased	0.09	0.00	0.93	0.01	0.00	0.01	0.30	0.04	0.14			
consumption has remained stable	0.80	0.35	0.07	0.56	0.21	0.50	0.68	0.75	0.79			
consumption has increased	0.11	0.65	0.00	0.43	0.79	0.49	0.02	0.21	0.07			
Past Change: Vegetables										199.71	0.000	0.24
consumption has decreased	0.04	0.00	0.02	0.00	0.00	0.00	0.00	0.01	0.09			
consumption has remained stable	0.77	0.31	0.65	0.31	0.24	0.43	0.30	0.51	0.81			
consumption has increased	0.19	0.69	0.33	0.69	0.76	0.56	0.70	0.48	0.11			
Future Consumption: Beef										77.70	0.000	0.53
consumption will decrease	0.01	0.01	0.00	0.00	0.60	0.41	0.86	0.00	0.77			
consumption will remain stable	0.98	0.98	0.91	0.94	0.40	0.59	0.14	0.83	0.23			
consumption will increase	0.02	0.01	0.08	0.06	0.00	0.00	0.00	0.17	0.00			
Future Consumption: Pork										168.94	0.000	0.45
consumption will decrease	0.03	0.09	0.00	0.01	0.62	0.01	0.74	0.51	0.00			
consumption will remain stable	0.96	0.91	0.92	0.97	0.38	0.96	0.26	0.49	0.51			
consumption will increase	0.01	0.00	0.08	0.02	0.00	0.04	0.00	0.00	0.49			
Future Consumption: Chicken										252.60	0.000	0.37
consumption will decrease	0.03	0.03	0.00	0.00	0.00	0.00	0.57	0.00	0.00			
consumption will remain stable	0.95	0.95	0.87	0.60	0.47	0.91	0.43	0.86	0.74			
consumption will increase	0.02	0.02	0.12	0.40	0.53	0.09	0.00	0.13	0.26			
Future Consumption: Vegetables										204.38	0.000	0.42
consumption will decrease	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00			
consumption will remain stable	0.87	0.72	0.77	0.09	0.09	0.48	0.24	0.34	0.25			
consumption will increase	0.12	0.27	0.23	0.91	0.91	0.52	0.76	0.66	0.75			

The biggest cluster containing 42.6% of the respondents was interpreted as a "No Change" cluster. This cluster had not made any major changes in their meat and vegetable consumption during the past few years, and had no intention to change them in the future either.

The second cluster (12.4%) included the respondents who had already decreased their beef and pork meat consumption as well as increased their vegetable consumption. This change was largely finished and no further reduction in beef and pork consumption or increase in vegetable consumption was expected to occur. The second cluster was therefore named as "Past change: less beef and pork".

"Past change: less all meat" is the name eligible for the third cluster. This cluster had already made changes decreasing the use of all three meat types and no further reduction in meat consumption was expected. The group size, 1.5 %, was small compared to the previous clusters.

The fourth cluster was interesting; there was an intention to increase the use of vegetables and to some extent also chicken meat but this did not occur by decreasing the pork or beef consumption. The size of the third cluster was 10.1% and it was named as "Ongoing change: more vegetables".

Also in the fifth cluster there was an ongoing change in meat consumption patterns. This change occurred especially as a reduction of beef and pork consumption, but the cluster was simultaneously strongly increasing its chicken meat and vegetables consumption. This group, with the cluster size of 9.6%, was named as "Ongoing change: less beef and pork, more chicken and vegetables".

Similarly, the sixth cluster (9.0%) reflected an ongoing change, but within this cluster the change differed from the previous cluster as the reduction focused only on beef consumption and no change in pork consumption was occurring. Instead there was an intention to stabilize pork and chicken meat consumption and to some extent to increase the use of vegetables in the future. This cluster was named as a group of "Ongoing change: less beef and more vegetables"

The seventh cluster (7.6%) was clearly intending to reduce the consumption of all meat varieties and therefore most probably the total meat consumption in their diet. At the same time, people in this cluster were increasing their vegetable use. This group had already made some changes in the past, but intended to even strengthen the change in the future. This group can be named as "Ongoing change: less all meat, more vegetables".

The eighth cluster was interpreted as a group also expressing an ongoing change. This cluster contained 6.3 % of the cases. In contrast to clusters five, six and seven, the reduction within this group concerned only pork. Similarly to many other clusters, in this group vegetable consumption was increasing. In addition, this group had the unique feature that some of the respondents stated to increase their beef consumption in the future. We named this group as "Ongoing change: less pork, more vegetables".

The ninth group was the smallest one (0.8 %.) In contrast to all the other clusters, in this group beef consumption had increased in the past, but in the future it was expected to decrease. In addition, these consumers intended to increase the use of pork and vegetables in the future. This group can be named as "Ongoing change: from beef to pork and vegetables".

Based on this 9-class solution the clusters were grouped into three larger blocks, each representing a different type of change in meat and vegetable consumption patterns. The first block (43%) was a 'No change' block, in which there had been no substantial consumption changes in the past, and neither were there indications of major changes taking place in the future. The second block (Cl 2 and 3) can be termed as a 'Past change' block (14%) in which meat consumption had already decreased but no significant changes were expected in the future. The third block (Cl 4-9) was named 'Ongoing change' (34%) because consumption habits had already started to change and were expected to continue to do so in the future. However, it is noteworthy that the patterns of change in this block take very different forms and directions. The shared feature of these changes

was that vegetable consumption increases in all (six) clusters within this block. The differences lie in the respective directions of beef, pork and chicken consumption.

For a more thorough cluster description the socio-demographics and the consumption frequency variables were used in the latent class model as inactive covariates. This means that the effect of the chosen covariates is not included in the model but inactive covariates provide useful descriptive information of the cluster members. Table 4 provides this information of the dominating characteristics of the consumers in each cluster. Furthermore, we examined the reasons for change in meat consumption both in the past and in the future with variance analysis. In Table 5, we present all the reasons where significant differences ($p<0.1$) between the clusters were observed. The statistically significant variables included healthiness, weight management, food safety, environmental effects, price and own economic situation and animal welfare. Variables such as safety, taste preferences, life situation as well as were not statistically different between the clusters. The most important reason over all the clusters both in the past and for the future change was the healthiness of food choices.

The socio-demographic background, consumption frequencies, as well as motivations for change provide us with more information to profile the clusters. The cluster that had indicated no past or future change (Cl 1) was male dominated. They reported having both beef and pork from one to two times per week as a main course, whereas a vegetable meal was consumed more seldom than once a month. They seemed to be meat lovers satisfied with their current consumption patterns.

The clusters that had changed their consumption patterns in the past were both female dominated. The cluster with less beef and pork (Cl 2) still consumed beef relatively often. As the amount of vegetable meals was relatively low it is probable that fish and chicken have taken the place of pork. Their motivations for past change were in most of the cases weight control and healthiness.

The cluster that had changed their consumption pattern by decreasing consumption of all the meat types (Cl 3) indicated high frequency of vegetable meals. The respondents in this female dominated cluster were more probably of middle or higher education, young and lived in single households. In addition to health reasons many of them also considered weight control and animal welfare as important reasons for past decrease in meat consumption.

Among the clusters with ongoing change in consumption patterns the cluster that intended to increase vegetables but not decrease meat (Cl 4) had very varying socio-demographic backgrounds. They ate meat based meals rather often and had economic, but also health and weight control reasons for the past change. Compared to other classes they considered economic reasons also important for their future consumption. As they were not intending to decrease their meat consumption while increasing the vegetables, it is possible that they might have had intention to control carbohydrates instead.

The cluster that was intending to replace meat with chicken and vegetables (Cl 5) also had strong health reasons but also relatively strong motivation because of the animal welfare and environmental issues. They were more probably from adult households.

The respondents in the next cluster (Cl 6) who were particularly interested in shifting from beef to vegetables were more often older females living in childless households. Although health and price were of some importance, no reason was particularly strong among them. This was in contrast to the next cluster (Cl 7) that had multiple and strong reasons for change. Among them animal welfare and environmental effects were considered more important than in any other cluster. They were also female dominated but in addition to younger females also the older age group was over-represented. In their consumption patterns vegetable meals were already a rather typical choice.

Table 4. The dominating socio-demographic characteristics and consumption profiles in the nine clusters.

Cluster blocks	*No change*	*Past change*		*Ongoing change*					
Clusters	Cl 1	Cl 2 less beef and pork	Cl 3 less all meat	Cl 4 more vegetables	Cl 5 less beef and pork, more chicken and vegetables	Cl 6 less beef and more vegetables	Cl 7 less all meat, more vegetables	Cl 8 less pork, more vegetables	Cl 9 from beef to pork and vegetables
Dominating characteristics									
Gender	Male	Female	Female	-	-	Female	Female	-	-
Age	-	-	Young	-	-	Older	Older and young	-	Young
Education level			Student and highest	Lower	Middle	Middle	Lower and highest	Highest	Highest
Household income level	-	-	Lower	Upper middle	-	-	-	Middle	Lower and higher
Household structure	-	-	Single household	-	Adult household	Childless couple	-	Household with children	Adult household
Beef: times / week or month*	1-2/wk	1-2/wk	1-3/month	1-2/wk	1-2/wk	1-2/wk	1-2/wk	>3 or 1-2/ wk	>3 or 1-2/ wk
Pork: times / week or month*	1-2/wk	1-3/ month	< 1/month	1-2/wk	1-2/wk	1-2/wk	1-3/month	1-3/month	1-2/wk
Vegetables: times / week or month*	<1/month	1-3/ month	>3/wk	<1/month	1-3/month	1-3/month	1-2/wk	1-3/month	<1/month

* as a main course

Also the cluster that decreased pork (Cl 8) considered healthiness as the most important reason for the change in consumption. These consumers were primarily from households with children and already ate pork relatively seldom but the frequency of beef meals was high.

The cluster that was shifting from beef to pork and vegetables (Cl 9) were typically younger consumers from adult households. Beef was currently dominating their diet. In their cluster the economic reasons were particularly important. Hence, the recent decrease in Finland in the relative price of pork compared with beef may for its part explain the shift between the meat types.

Table 5. The reasons for change in meat consumption that differ significantly between the clusters (analysis of variance).

Cluster blocks	*No change*	*Past change*		*Ongoing change*					
Clusters	Cl 1	Cl 2 less beef and pork	Cl 3 less all meat	Cl 4 more vegetables	Cl 5 less beef and pork, more chicken and vegetables	Cl 6 less beef and more vegetables	Cl 7 less all meat, more vegetables	Cl 8 less pork, more vegetables	Cl 9 from beef to pork and vegetables
		Importance of the reason for consumption change, mean (scale 1-3)							
Past									
Healthiness		2.35	1.89	2.34	2.47	2.26	2.45	2.26	1.27
Environmental effects		1.58	1.49	1.47	1.62	1.55	1.96	1.46	0.79
Price		1.89	1.86	2.05	1.85	2.02	1.86	1.86	2.22
Animal welfare		1.62	1.95	1.54	1.73	1.58	2.12	1.67	1.56
Weight control		2.03	2.00	2.04	2.25	2.01	1.98	1.91	1.44
Future									
Healthiness				2.51	2.67	2.48	2.65	2.27	2.27
Environmental effects				1.80	1.94	1.92	2.25	1.80	1.91
Food safety				1.96	1.95	1.94	2.03	1.94	1.36
Price				2.14	2.06	2.04	1.98	1.83	2.18
Animal welfare				1.77	1.97	1.81	2.28	1.92	1.82
Weight control				2.24	2.38	2.09	2.05	2.05	1.64

Discussion and conclusion

The results showed that a large number of the respondents, over 40%, had stabile consumption patterns. However, it is notable that there were even more people who felt that they had changed eating patterns or were in the middle of an ongoing change. Generally this change meant increasing the consumption of vegetables and decreasing the use of meat. The variety of changes in consumption habits was indeed very intriguing, indicated by the fact that the analysis produced nine clusters each with its own particular features. This is in line with Grunert's (2006) observations of increasing fragmentation and diversification of food consumption habits.

The results indicated a definite interest towards changing food and eating habits. This is probably related to current debates around the healthiness, sustainability and ethics of our present omnivorous diet. Yet, it seemed that relatively few people were planning to call a total halt for eating meat. Instead, many were planning to cut down the amount or the variety of meats eaten. In addition, there was a smaller group of people who already have reduced their meat consumption in the past and do not plan further changes. The considerably higher share of those respondents who were planning to change their consumption patterns than had actually conducted the change may on one hand imply that major changes are forthcoming. On the other hand the difference may indicate that all the intentions do not finally end up changing the actual behaviour.

The results also showed that some socio-demographic characteristics of consumers differentiate the classes from each other. For instance, in the 'No change' cluster (block) there were more men than women, whereas in all the other clusters the gender distribution was either even or female dominated. With regard to age, there was a large proportion of elderly people particularly in those clusters that had either reduced their meat consumption in the past or are in the process of doing so,

or are increasing their vegetable consumption. In contrast, the 'No change' cluster/block was very even in its age distribution. There were also some differences in the educational backgrounds of the clusters.

A general trend among almost all the respondents who can be interpreted as being in the middle of some kind of a change in food consumption is the expressed intention to eat more vegetables in the future. This can probably be seen as a sign of the ideal of eating a healthy diet. Indeed, healthiness was one of the most salient stated reasons for change in consumption habits. Although healthiness was important in general, the ways to put it in practice were very versatile. The results implicated that healthiness gave a reason to give up meat, but other motivations defined more specifically how to direct the reduction. If price was perceived as important, the reduction was more easily directed to beef.

Research on meat consumption has pointed out that even though people as citizens express environmental and animal welfare related concerns of meat production they are not very well channeled into the choices that people make as consumers (e.g. Mayfield et al. 2007, Verbeke et al. 2010). Hoogland et al. (2005) relate the attitude-behavior conflict to two trends that are relevant for meat consumption. People are indeed concerned about animal welfare, but at the same time, meat as food is increasingly dissociated from its animal origin so that people do not think of eating an animal when consuming meat (see also Frewer et al. 2005). They also propose that together these two trends may partly explain why people may behave contrary to their values: increasing concern for animal welfare does not necessarily lead to decreasing meat consumption. In our case we identified a small segment of consumers (1.5%) that had changed their consumption patterns for environmental and animal wellbeing reasons. A somewhat larger segment (8%) was intending to do so. As intentions are closer to actual behavior than attitudes, we can assume that part of these consumers will actualize their intentions in the future.

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