

This item is the archived peer-reviewed author-version of:

Meat morals : relationship between meat consumption consumer attitudes towards human and animal welfare and moral behavior

Reference:

De Backer Charlotte, Hudders Liselot.- *Meat morals : relationship between meat consumption consumer attitudes towards human and animal welfare and moral behavior*

Meat science / Danish Meat Research Institute - ISSN 0309-1740 - (2014), p. 1-32

DOI: <http://dx.doi.org/doi:10.1016/j.meatsci.2014.08.011>

Handle: <http://hdl.handle.net/10067/1188200151162165141>

Accepted Manuscript

Meat Morals: Relationship Between Meat Consumption Consumer Attitudes towards Human and Animal Welfare and Moral Behavior

Charlotte J.S. De Backer, Liselot Hudders

PII: S0309-1740(14)00276-9
DOI: doi: [10.1016/j.meatsci.2014.08.011](https://doi.org/10.1016/j.meatsci.2014.08.011)
Reference: MESC 6532

To appear in: *Meat Science*

Received date: 14 January 2014
Revised date: 7 July 2014
Accepted date: 20 August 2014



Please cite this article as: De Backer, C.J.S. & Hudders, L., Meat Morals: Relationship Between Meat Consumption Consumer Attitudes towards Human and Animal Welfare and Moral Behavior, *Meat Science* (2014), doi: [10.1016/j.meatsci.2014.08.011](https://doi.org/10.1016/j.meatsci.2014.08.011)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Running Head: MEAT AND MORALS

**Meat and Morals: Relationship Between Meat Consumption, Consumer Attitudes
towards Human and Animal Welfare and Moral Behavior.**

Charlotte J.S. De Backer ^a

Liselot Hudders ^b

^a *Department of Communication Studies, University of Antwerp*

Sint-Jacobstraat 2, 2000 Antwerp, Belgium

^b *Department of Communication Studies, Ghent University,*

Korte Meer 7-11, 9000 Ghent, Belgium

Corresponding author [Liselot Hudders] Liselot.Hudders@Ugent.be

Not for publication: Phone: +32 264 91 89 Mobile: +32 486176120 Fax: +32 2646992

Meat and Morals: Relationship Between Meat Consumption, Consumer Attitudes towards Human and Animal Welfare and Moral Behavior.

1 Introduction

Accumulating evidence assumes that the acquisition and consumption of meat has shaped major parts of our human psychology and behavior (Stanford & Bunn, 2001), and human morality in particular (Mameli, 2013). Throughout the evolutionary history of human kind, food, and meat in particular, appears to have shaped mechanisms that underlie cooperative intentions and actions (Hill, 2002). Compared to other foods and resources, meat may have played a more crucial role in the evolution of cooperation, because cooperation necessitates both the acquisition of most meat (Hill, 2002; Lee & DeVore, 1968) and the distribution of it (Hawkes, 2001). Various theories explaining the sharing of meat (Gurven, Hill, Kaplan, Hurtado, & Lyles, 2000; Patton, 2005) suggest that meat sharing occurs beyond the family, to members of a social network based on reciprocal actions. Accumulating and summarizing all the evidence, Mameli (2013) recently concluded that meat might have made us moral. The sharing of meat resulted in the evolution of a moral system that nowadays sustains human fairness in general.

In contrast, in today's modern society those who ban meat from their diet are seen as more virtuous compared to omnivores (Ruby & Heine, 2011). A kernel of truth appears to exist for this perception bias, as previous works have shown proof of a correlation between meat avoidance and moral concerns (Rozin, Markwith, & Stoess, 1997). Of course one may argue that, since vegetarians eat less fatty foods and have a lower body mass index (Rizzo, Jaceldo-Siegl, Sabate, & Fraser, 2013), the "vegetarian equals virtuousness" stereotype fits into the positive personality traits attributed to

consumers of low-fat diets. Accordingly, consumers of high-fat foods are assigned more negative personality traits (Barker, Tandy, & Stookey, 1999; Vartanian, Herman, & Polivy, 2007; Stein & Nemeroff, 1995). Even after controlling for perceptions of diet healthiness in their analysis, Ruby and Heine (2011) still found that vegetarians are considered as more virtuous compared to omnivores. It appears to be the decision to ban meat that matters for the perception of virtuousness, above and beyond the effect of perceptions of diet healthiness. When looking at the motives underlying meat consumption and meat reduction, this perception bias appears to be based in fact.

Starting with motives for meat consumption, among omnivores, quality cues such as tenderness and flavor drive meat consumption (Troy & Kerry, 2010). Taste plays a major role as a reason for eating meat (Richardson, MacFie, & Shepherd, 1994). The love for the “taste of meat” is a major threshold among men and women of all ages who are reluctant to reduce their meat consumption (Lea & Worsley, 2003a).

Further, most motives to reduce or ban the consumption of meat can be split into personal health motives and moral motives. The personal health motives refer to the fact that meat may expose consumers to health hazards, such as increased additives, hormones and cholesterol levels (Richardson et al., 1994). The moral motives refer to animal health concerns and ecological concerns (e.g. Kalof, Dietz, Stern, & Guagnano, 1999; Latvala, Niva, Makela, Pouta, Heikillä, Kotro, & Forsman-Hugg, 2012; Rozin et al., 1997; Ruby, 2012; Tobler, Visschers & Siegrist, 2011). Research suggests that flexitarians are mainly driven by personal health concerns (Forestell, Spaeth, & Kane, 2012; Fox & Ward, 2008; Hoek, Luning, Stafleu, & de Graaf, 2004; Lea & Worsley, 2003a,b). In Flanders, research showed that although flexitarians equally care about environmental issues compared to vegetarians (De Backer & Hudders, in press), most people are only moderately aware of the fact that meat production causes a stress to the

environment (Vanhonacker, Van Loo, Gellynck, & Verbeke, 2013). Vegetarians are set apart from flexitarians by a conscious, explicit and more intense motivation to reduce or ban meat from one's diet because of animal concerns (De Backer & Hudders, in press). Not to say that omnivores do not care about animal welfare; even meat retailers are concerned about animal welfare issues, especially in times of economic prosperity (Miranda-de la Lama, Sepulveda, Villaroel, & Maria, 2013). Yet when comparing compassion for animals among vegetarians and omnivores, the first group outscores the latter (Greene-Finestone, Campbell, Evers, & Gutmanis, 2008). Because we do not know yet how flexitarians' general compassion for animals contrasts to that of vegetarians and full-time meat eaters, this will be the first question addressed in our study.

Next, the different motives underlying diet choice relate to broader worldviews. From a range of studies among predominantly Western populations, beliefs that vegetarianism is beneficial to health, the environment, farm animals, and world hunger appear to be influenced by other values, particularly altruism (Dietz, Frisch, Kalof, Stern, & Guagnano, 1995; Kalof et al. 1999). People with more social tendencies towards animals and humans are more likely to be (come) vegetarian or vegan (Ruby, 2012). Compared to omnivores, ethically motivated vegetarians and vegans have higher engagement of empathy related brain areas while observing negative scenes of both humans and animals (Filippi, Riccitelli, Falini, Di Salle, Vuilleumier, Comi, & Rocca, 2010). These stronger prosocial beliefs also translate into different political views; clear, outspoken concerns about harm and fairness typify a liberal political morality and concerns about ingroup/loyalty, authority/respect, and purity/sanctity are linked to traditional world views (Graham, Haidt & Nosek, 2009). Vegetarians tend to be more liberal, while omnivores tend to place greater importance on traditional values (Ruby, 2012). In similar ways, Kalof et al. (1999) added that traditional values decrease the

likelihood that people would endorse vegetarian beliefs. May it also decrease the likelihood that people would not endorse strict vegetarianism, but consciously reduce their intake of meat (i.e. become flexitarian)? Flexitarians are a growing group of consumers that reduce, but do not ban, meat from their diet (Dagevos & Voordouw, 2013). The differences in moral concerns among flexitarians compared to vegetarians and full-time meat eaters are not yet known. To investigate this, scores on the five domains of the Moral Foundations Theory (Haidt & Graham, 2007; Haidt & Joseph, 2004) will predict diet patterns.

In addition, and because previous research has focused predominantly on the association between diet choice and moral attitudes, with little or no attention to moral behavior, we will also investigate if and how flexitarians differ from vegetarians and full-time meat eaters in terms of donating money to animal- and human-oriented charities.

For all analyses, gender, age and educational level will be used as control variables in the study presented, this because across time and culture, a vegetarian diet has been associated more often with women compared to men (Ruby, 2012). Regardless of whether the diet implies meat consumption or avoidance, women are more concerned with animal welfare and environmental protection than men (Ruby, 2012). Gender, ethical concerns and intentions to reduce meat appear to interact. For instance, in a study among Australian non-vegetarians, Lea and Worsley (2003a) found that women are significantly more likely than men to agree that meat reduction can help animal welfare. Apart from gender and age, other demographic variables link to meat consumption, such as educational level. Several previous studies have shown that education level positively relates to meat reduction and negatively to fondness for red meat (see Ruby, 2012).

In sum, the aim of this study is to investigate whether diet choice can be predicted by consumer attitudes towards human and animal welfare. Therefore, we will investigate if and how animal concerns (research question 1) and moral domains (research question 2) related to harm and fairness (i.e. more liberal) or related to loyalty, respect and purity (i.e. more conservative) can predict an individual's choice for a flexitarians diet versus a vegetarian diet versus a full-time meat eating diet. As a new added element, differences in moral behavior (i.e., donation to charities) are taken into account (research question 3).

2 Materials and Method

To test the predictions, an online survey was conducted to investigate the relationship between eating patterns with and without meat, as well as prosocial attitudes and – behavior. This study was implemented in full compliance with American Psychological Association (APA) guidelines on the conduct of research involving human subjects. Ethical approval was obtained from the Ethical Committee of Social Sciences and Humanities, University of Antwerp, Belgium. Participants were fully informed about the general aims of the study and that their anonymity was guaranteed; all participants provided informed consent.

2.1 Sample and procedure

A total of 505 Flemish respondents took part in the survey. However, 155 individuals did not complete the questionnaire and 51 individuals were omitted based on the criteria of the Moral Foundations Questionnaire (MFQ) catch items (see below). That is, anyone who believed math skills are related to virtuousness was omitted (N = 38

responded with the last three response options on MATH), and anyone who disagreed that it is better to do good than to do bad, was omitted (N = 13 responded with the first three response options on GOOD). This leaves a total of 299 individuals: 62% women, 38% men (see Table 1 for an overview of the socio-demographic characteristics of the sample). The age of the respondents ranged from 20 to 76 years ($M_{age} = 34.40$, $SD = 12.58$). Over half of the sample (58.6%) obtained a high school or university degree.

[Table 1 about here]

Cross-sectional data were collected through a web-based survey in Flanders (the northern Dutch-speaking part of Belgium) during March-April 2012. No incentives were given for participating in this study. The study used a convenience sampling procedure. Hence, results mainly apply within the characteristics of the sample, whereas generalizations to wider populations remain speculative. The survey was distributed among students (using university lists), and people in general, by sharing the survey online via social network sites. In addition, a link to the web-based survey was disseminated via a vegetarian organization, Ethisch Vegetarisch Alternatief (EVA). This was done to ensure a large enough sample of vegetarians in the study, because meat is still considered the centerpiece of a traditional meal in the Flemish food culture, and negative images of meat substitutes still need to be addressed in Flanders today (Vanhonacker et al., 2013). EVA is a non-profit organization promoting meat reduction and vegetarian diets in Flanders, focusing on health benefits and ecological concerns. As an example, inspired by the US “Meatless Mondays” campaign, EVA launched “Donderdag Veggiedag” (which translates to Meatless Thursdays) in 2009. The campaign took a successful start, with some schools offering vegetarian lunches on Thursdays (Van Caneghem, Verschraegen, De Keyzer, & Huybrechts, 2010). EVA wants

to promote meat reduction, by promoting both a vegetarian and flexitarian diet (Lenaerts, 2011). Their aims are different from other Flemish organizations, such as Global Action in the Interest of Animals (GAIA) who promote vegetarianism mainly (and almost solely) out of concern for the well-being of animals. Our web-based survey was not distributed via GAIA, because its membership would have biased our sample.

2.2 Materials

First, the participating respondents indicated their diet choice. Next, they were asked to indicate their attitudes towards animal and human welfare. To conclude, they had to complete some socio-demographic questions, such as age, gender and educational level.

2.2.1 Diet Choice

To determine eating habits, respondents were asked to indicate which diet they follow out of list of nine eating diets: 1) full-time meat eater (eating (red) meat, fish and chicken), 2) flexitarian (consciously reducing meat intake, but eating meat now and then), 3) pollotarian (eating no red meat, but eating fish, chicken and other poultry), 4) pescotarian (eating no red meat or chicken, but eating fish and shellfish), 5) macrobiotic consumer (eating unprocessed, organic, and locally grown foods, with a great overlap with foods consumed in a vegetarian diet, yet also including certain kinds of meat), 6) lacto-ovo vegetarian (eating no meat or fish, but eating eggs and dairy produce), 7) lacto-vegetarian (eating no meat, fish or eggs, but eating dairy produce), 8) ovo-vegetarian (eating no meat, fish or dairy produce, but eating eggs), or 9) vegan (eating no meat and using no products of animal origin).

These subcategories were then grouped into three categories: full-time meat eaters (subcategory 1, N= 90, 30.1%), flexitarians (subcategories 2, 3, 4 and 5, N= 83, 27.8%) and vegetarians (subcategories 6, 7, 8, and 9, N= 126, 42.1%). Flexitarians are defined in our sample as those who consciously reduce their intake of either all types or specific types of meat (e.g., eating poultry and fish but no red meat), or macrobiotics, who strongly reduce their meat intake and only eat unprocessed meat from organic farming. Vegetarians are defined in our sample as people who eat neither meat nor fish.

2.2.2 Animal and Human Welfare Attitudes

Respondents' attitudes toward the importance of animal welfare were measured with the 20-item Animal Attitude Scale ($\alpha = .92$) (Herzog, Betchart, & Pittman, 1991).

Individuals' attitudes towards human welfare were measured with the 30-item Moral Foundations Questionnaire (Graham, Nosek, Haidt, Iyer, Koleva, & Ditto, 2011). The Moral Foundations Theory considers five types of moral issues: harm/care, fairness/reciprocity, ingroup/loyalty, authority/respect and purity/sanctity. Harm/care focuses on motives to relieve suffering, closely related to empathy and compassion. Fairness/reciprocity refers to reaping the benefits of cooperation in small groups. Ingroup/loyalty builds on cooperation benefits in larger social groups. Groups offer protection, especially in times of competition, and are valued for that. Authority/respect emphasizes the recognition of, and respect for, status and the protection it provides to subordinates. The purity/sanctity dimension includes beliefs about the importance of following divine/religious mandates, such as sexual chastity and focuses on the challenge of impurities that might spread via other people or food. Different from the other dimensions, this foundation is rooted in human' physical nature (as omnivores),

rather than only human' social nature. Moral systems built on this foundation promote a life that is pure, sanctified and rising above what is trivial and physical.

For the analyses, the 30-item Moral Foundations Questionnaire was divided in these five sub-dimensions, each originally consisting of six items. Two of these dimensions have alpha scores in our sample that could not improve by removing an item: Ingroup/loyalty ($\alpha = .66$), purity/sanctity ($\alpha = .67$). The alpha scores of the other three dimensions slightly benefit from removing one item. For the harm/care dimension removing the item *'It can never be right to kill a human being'* slightly improved the alpha score to $\alpha = .57$. For the fairness/reciprocity dimension removing the item *'I think it's morally wrong that rich children inherit a lot of money while poor children inherit nothing'* improved the alpha score to $\alpha = .60$. For the Authority/respect dimension, removing the item *'Men and women each have different roles to play in society'* improved the alpha score to $\alpha = .70$.

2.2.3 Moral behavior

Next to measuring moral attitudes, this study also added a behavioral measure, donation behaviors. Donation behavior was measured by asking respondents to indicate if they donated money to a charity in the previous six months. They were given a list of well-known charities and the option to add a charity not mentioned in this list. In the end a variable was created that categorically indicated if they had not donated (0), donated to human-oriented charities (1) or donated to animal/nature-oriented charities (2). The people who donated to both human- and animal/nature-oriented charities were categorized in both 1 and 2.

3 Results

First, the relations between diet choice and attitudes towards animal and human welfare are discussed, followed by the results of the analysis between diet pattern and donation behavior.

3.1 Animal welfare attitudes to predict diet choice

To investigate if diet choice is predicted by animal welfare attitudes (Research Question 1) a multinomial logistic regression is conducted with diet choice as the dependent variable and animal welfare attitudes as the independent variable (see Table 2). The flexitarian group was used as a baseline group. The results of this analysis revealed that the full model showed a significantly better fit than the constant-only model, indicating that the predictor could reliably distinguish between the three diet groups ($\chi^2(2) = 189.65, p < .001$). The model fits the data well (Pearson $\chi^2(104) = 95.28, p = .72$). Well over half of the cases (63.5%) could be classified correctly based on this variable, which is more than can be expected by chance. The percentage of cases correctly classified was 66.7% for meat eaters, 29.6% for flexitarians and 83.2% for vegetarians. The animal welfare attitudes appeared to be significant predictors of diet choice, ($\chi^2(2) = 189.65, p < .001$). An in-depth analysis on how animal welfare attitudes distinguished vegetarians from flexitarians revealed that for each unit increase in animal welfare attitudes, the change of the odds of being in the vegetarian group compared to the flexitarian group is 18.12 and the change in odds of being in the meat eater group compared to the flexitarian group is .19. This implies that if animal welfare attitudes increase, the odds of being in the meat eater group compared to being in the flexitarian group decreases by 81%.

[Table 2 about here]

3.2 Human welfare attitudes to predict diet choice

To reveal if diet choice is predicted by human welfare attitudes a multinomial logistic regression is conducted with the five dimensions of human welfare attitudes as predictors of diet choice (see Table 3). The flexitarian group was used as a baseline group. The results of this analysis revealed that the full model showed a significantly better fit than the constant-only model, indicating that the predictors could reliably distinguish between the three diet groups ($\chi^2(10)= 73.95, p< .001$). The model fits the data well (Pearson $\chi^2(572)= 584.10, p= .35$). Over half of the cases (55.8%) could be correctly classified based on these variables. The percentage of cases correctly classified was 57% for meat eaters, 25.9% for flexitarians, and 74.4% for vegetarians. Overall, the results showed that fairness/reciprocity ($\chi^2(2)= 3.15, p= .21$), ingroup/loyalty ($\chi^2(2)= 2.92, p= .23$) and purity/sanctity ($\chi^2(2)= 2.01, p= .37$) were not significantly related to diet choice. Harm/care ($\chi^2(2)= 19.64, p< .001$) and authority/respect appeared to be significant predictors of diet choice, ($\chi^2(2)= 23.84, p< .001$).

An in-depth analysis on how human welfare attitudes distinguished vegetarians from flexitarians revealed that for each unit increase in harm/care, the change in the odds of being in the vegetarian group compared to the flexitarian group is 4.67. All other dimensions could not significantly distinguish vegetarians from flexitarians. An in-depth analysis on how human welfare attitudes distinguished meat eaters from flexitarians revealed that for each unit increase in authority/respect, the change in odds of being in the meat eater group compared to the flexitarian group is 3.57. All other dimensions could not significantly distinguish meat eaters from flexitarians.

[Table 3 about here]

3.3 Moderating impact of age on the relationship between diet choice and human and animal welfare attitudes

A first multinomial logistic regression analysis with age (split into two categories based on a median split, median= 30 years) and animal welfare attitudes revealed no main effect of age nor any significant interaction effects between age and the animal welfare attitude scale to predict diet choice.

A second multinomial logistic regression analysis with age and human welfare attitudes revealed no main effect of age nor any significant interaction effects between age and the human welfare attitude dimensions to predict diet choice.

3.4 Moderating impact of gender on the relationship between diet choice and human and animal welfare attitudes

A first multinomial logistic regression analysis with gender and the animal welfare attitude scale revealed no significant main effect of gender nor any significant interaction effects between gender and the animal welfare attitude scale to predict diet choice.

A second multinomial logistic regression analysis with gender and the different human welfare attitudes revealed a significant main effect of gender on diet choice ($\chi^2(2) = 9.56, p = .008$). For women, the change in odds of being in the meat eater group compared to the flexitarian group is .005 and the change in odds of being in the vegetarian group compared to the flexitarian group is .078, however the latter odds ratio

is only marginally significant ($p = .069$). In addition, the analysis showed a significant interaction effect between gender and authority/respect to predict diet choice ($\chi^2 (2) = 6.10, p = .047$). For women, each unit increase in authority/respect, changed the odds of being in the meat eater group compared to the flexitarian group by 4.09, while authority/respect did not predict a difference in membership of flexitarian versus vegetarian groups. For men, each unit increase in authority/respect, changed the odds of being in the meat eater group compared to the flexitarian group by .245, and similar to women, no differences in authority/respect occur for the flexitarians versus vegetarians. No other significant interaction effects appeared between gender and the moral foundations.

3.5 Moderating impact of education level on the relationship between diet choice and human and animal welfare attitudes

A first multinomial logistic regression analysis with educational level and the animal welfare attitude scale revealed a significant main effect of educational level on diet choice ($\chi^2 (2) = 9.95, p = .007$). Without higher education, the odds of being in the meat eater group compared to the flexitarian group increased 105%. There were no significant interaction effects between educational level and the animal welfare attitude scale to predict diet choice.

A second multinomial logistic regression analysis with educational level and human welfare attitudes revealed no significant main effects of educational level nor any significant interaction effects between educational level and the human welfare attitude dimensions to predict diet choice.

3.6 Diet choice and charity donations

The final analysis examines whether diet choice relates to *donation behaviors*. The analyses reveal that charitable donations are more likely among vegetarians than among meat eaters (respectively 85.7% and 63.4%, $z = -4.05$, $p < .001$). Flexitarians balance in between (73.7%) and are significantly different from vegetarians ($z = 2.36$, $p = .02$), but not from meat eaters ($z = -1.51$, $p = .13$). These results show that vegetarians, but not flexitarians donate more to charities than meat eaters do.

The detailed results for donations to human-oriented and animal/nature oriented charities are presented in Table 4. Among vegetarians (34.52%), donations for animal/nature oriented charities are more likely than among meat eaters (8.60%, $z = 4.56$, $p < .001$) and flexitarians (13.68%, $z = 3.6$, $p < .001$). Meat eaters and flexitarians do not differ from each other for their donations to animal/nature oriented charities ($z = -1.11$, $p = .27$). For human-oriented charities, donations are as likely for meat eaters (54.8%) versus flexitarians (60%, $z = -.72$, $p = .47$), and meat eaters versus vegetarians (51.30%, $z = .54$, $p = .59$). Vegetarians and flexitarians also do not differ from each other ($z = -1.34$, $p = .18$). These results show that vegetarians donate more to animal-oriented charities, but there are no significant differences for human-oriented charities.

[Table 4 about here]

4 Discussion

4.1 Animal welfare attitudes and meat consumption

The results of this study among a non-random Belgian sample show that there is an association between general attitudes towards animal welfare and diet choice options for vegetarians (never eating meat), flexitarians (consciously reducing meat

intake, but still eating meat) or full-time meat eaters (no conscious reduction of meat in the diet). More specifically, animal concerns (measured by the Animal Attitude Scale) can predict the difference between opting for a flexitarian diet versus a vegetarian diet or full-time meat diet. In addition, the difference between the flexitarians and vegetarians is larger compared to flexitarians and full-time meat eaters. Thus, the general trend of these findings suggests that the more one is concerned about animal welfare, the more one reduces meat from their diet.

The results of this study are in line with research that shows that the diet choice of vegetarians is much more motivated by animal concerns than that of flexitarians (e.g., De Backer & Hudders, in press). The benefit to this existing research is the investigation of how flexitarians contrast to vegetarians and full-time meat eaters in animal attitudes. The fact that this group of consumers expresses significantly different concerns than both vegetarians and full-time meat eaters is interesting for marketers who wish to target this emerging group of people.

4.2 Human welfare attitudes and meat consumption

Domains of human morality also appear to be associated with diet choice. These results were obtained by predicting diet choice based on the five moral dimensions of the MFQ. It must first be mentioned that most of the alpha scores of these dimensions were rather low, but in line with previous reports (e.g., Graham et al., 2009). In addition, within social science research it is not uncommon to have lower reliability scores (Kline, 1999). And some could be slightly improved by removing one item. This was done, and therefore, the underlying structure of the dimensions discussed here may differ slightly from underlying structures of these dimensions in other publications.

With this in mind, every increase in one's belief that human suffering (harm/care of MFQ) must be avoided corresponds to a significant and large increase in the chance of being vegetarian compared to flexitarian. An increase in one's belief that respect for status is important (authority/respect of MFQ) corresponds to a significant increase in chances to be a full-time meat eater rather than a flexitarian. These results become interesting in comparison to some previous studies. Namely, as mentioned in the introduction, it is known that vegetarians have more prosocial tendencies (Filippi et al., 2010; Preylo & Arikawa, 2008; Ruby, 2012). It calls for further investigation into whether and how flexitarians differ from vegetarians and full-time meat eaters in terms of empathy, in line with the methodology of Filippi et al. (2010). That study also asked all participants to complete the Empathy Quotient and the descriptive results showed that vegetarians outscore omnivores, exhibiting higher empathy levels. It would be interesting to learn further if such differences can also distinguish these two groups from their middle option: the flexitarians.

From this study, it can be concluded that flexitarians differ from both vegetarians and full-time meat eaters in terms of their attitudes towards two domains of human moral foundations, harm/care and authority/respect.

4.3 Moral behavior and meat consumption

Next to looking at moral attitudes, this study also investigated the relation between diet choice and moral behavior. The results of our behavioral data suggest that donation to human-oriented charities are just as likely to come from vegetarians, flexitarians or full-time meat eaters. In contrast, donations to animal-oriented charities are more likely to come from vegetarians compared to both flexitarians and full-time

meat eaters, who do not differ from each other. Thus, in terms of prosocial behavior, flexitarians in this sample do not appear to be different from full-time meat eaters in this sample, despite the fact both groups show different values on attitudes towards animal welfare and respect for other human beings (authority/respect). For vegetarians, both their attitudes towards animal welfare and their prosocial behavior towards animals (i.e., donating money to animal-oriented charities) set them apart from flexitarians in this sample.

4.4 Societal norms and meat consumption

Some of the differences found in this study can be explained by the dominating norms that govern a society. For instance, a feasible, explanation for the significant difference between flexitarians and full-time meat eaters with respect to placing value on the authority/respect dimension of the MFQ might be the fact that consuming meat on an (almost) daily basis is the norm in the society of this study. In Belgium, meat has always been considered part of the ideal diet, except during the World Wars period (Scholliers, 2013). Moreover, mid-twentieth century meat consumption began to rise (Bublout, 1961; Mauquoy, 1960) and remained high, with Belgium becoming one of the biggest meat consumers in Europe (Grigg, 1993). A slight decline in Belgian meat consumption appeared in the 1990's, driven by a mix of factors, including health concerns, risk perceptions, and changing tastes (Verbeke & Viaene, 1999, 2000).

Yet, Belgians, and Flemish people in particular, remain heavy meat consumers, as reported by the most recent Belgian Food Consumption Survey, conducted in 2004 (Debacker, Cox, Temme, Huybrechts, & Van Oyen, 2007). According to this study, a decade ago, 56.3% of the Belgian population ate meat at least once a day. In Flanders, the northern region of Belgium where the research for this study was conducted, 64.9%

ate meat at least once a day in 2004. In contrast, at that time only a very small fraction (1.5%) of the Flemish population reported never eating any meat (Debacker et al., 2007). In 2011, EVA conducted a similar survey in Flanders, also focusing on flexitarians as a new and rising group of consumers (Lenaerts, 2011). The results of this study were similar: 1.5% of the Flemish population was vegetarian at that point, while 11.6% of the population considered themselves flexitarian (Lenaerts, 2011). If the norm is to eat meat, then consciously reducing meat intake automatically implies not following the norm or not obeying general rules. This may explain the significant difference in moral attitudes between flexitarians and meat eaters. Moreover, it would be interesting to investigate further if flexitarians consciously feel as if they are a minority group, as it is known that vegetarians often feel this way (Fox & Ward, 2008; Rozin et al., 1997).

4.5 Socio-cultural and political determinants of meat consumption

Lastly, apart from dominating societal norms, a range of other socio-cultural and political determinants may also explain some of the results of our study. For instance, in Western countries, it is found that vegetarians lean more towards a liberal point of view, whereas omnivores place greater value to traditional views (Kalof et al., 1999; Ruby, 2012). With respect to the MFQ dimensions, it is known that conservatives outscore liberals in terms of the authority/respect dimension, while liberals outscore conservatives on the harm/care dimension (Graham et al., 2009). Therefore, the results of this study indirectly reconfirm past research: (Western) vegetarians (more liberal) put stronger value on care and empathy, while (Western) full-time meat eaters (more conservative) put stronger value on respect and authority. However, future research should investigate whether similar results may be obtained in other (non-Western)

countries, as Ruby, Heine, Kamble, Cheng & Waddar (2013) found cross-cultural differences in value orientations among vegetarians.

Further, the current study did not consider political orientation, yet we do advise future studies to investigate if political orientation mediates the association between diet choice and these human moral foundations. In Belgium political orientations are not as linear compared to other countries, such as the United States. Political parties are plentiful (David & Van Hamme, 2011), yet it might be worthwhile to ask future participants to indicate on a semantic scale whether they adhere more towards traditional versus liberal political views. In addition, it would also be useful to add more variables related to participants' cultural and socio-economic (such as income or job status) background. This study controlled for age, gender and educational status. The results of our study showed that age did not moderate the relationship between diet choice and animal and human welfare attitudes. For gender, one significant interaction effect was found with the moral foundation authority/respect. More specifically, the results showed that an increase in authority/respect, predicts a higher likelihood to be full-time meat eater compared to flexitarian for women, while the reverse is found for men. With every increase in authority/respect, men are more likely to be flexitarian compared to full-time meat eater. The result of our female respondents fits previous research (Ruby, 2012), but the result of our male respondents goes against previous results that showed how traditional views decrease a meat-reduced diet (Kalof et al. 1999). Of course, Kalof et al.'s study only looked at omnivores versus vegetarians, while this study added flexitarians as a separate group of consumers. Still, this result calls for further investigation.

Although no significant interaction effects appeared for education, moral foundations and diet choice, the results do show a main effect for the correlations

between educational level and diet choice. Lower levels of education correspond to higher chances of opting for a full-time meat eating diet. This is in line with previous findings (Hoek et al., 2004; Ruby, 2012) and calls for further follow-up and investigation.

5 Conclusions and Implications

Our results reveal that flexitarians differ from both vegetarians and full-time meat eaters in their attitudes towards animals welfare. They are more concerned about animal welfare than full-time meat eaters are, yet less concerned compared to vegetarians. In addition, their scores on two dimensions of human moral foundations set flexitarians apart from both vegetarians and full-time meat eaters. Compared to flexitarians, vegetarians score higher on values of care and empathy. Compared to full-time meat eaters, flexitarians score lower on respect for status and authority. Despite these clear differences in moral attitudes, flexitarians are not different from full-time meat eaters in terms of prosocial behavior; they donate as often to human-oriented charities. In addition, the behavioral results reconfirm vegetarians' stronger caring for animal concerns, as this group donates more frequently to animal-oriented charities compared to both other groups.

The main implication of this study for the production and promotion of meat is to consider flexitarians as a separate group of consumers. Flexitarians are as different from full-time meat eaters as they are different from vegetarians, both in their moral attitudes and –behaviors. Acknowledging these differences and targeting as a unique and growing group of consumers is a challenge for the meat industry and for marketers in the following years.

References

- Adams, C. J. (1990). *The Sexual Politics of Meat: A Feminist Vegetarian Theory*. New York: Continuum.
- Barker, M. E., Tandy, M., & Stookey, J. D. (1999). How are consumers of low-fat and high-fat diets perceived by those with lower and higher fat intake? *Appetite*, *33*, 309-317.
- Bublott, G. (1961). Note on beef production in Belgium. *Agricultura*, *8*, 51-59.
- Dagevos, H., & Voordouw, J. (2013). Sustainability and meat consumption: Is reduction realistic. *Sustainability: Science, Practice, & Policy*, *9* (2), 60-69.
- David, Q., & Van Hamme, G. (2011). Pillars and electoral behavior in Belgium: The neighborhood effect revisited. *Political geography*, *30* (5), 250-262.
- De Backer, C. J. S., & Hudders, L. (2014). From meatless Mondays to meatless Sundays: Motivations for meat reduction among vegetarians and semi-vegetarians who mildly or significantly reduce their meat intake. *Ecology of Food and Nutrition*, in press.
- Debacker, N., Cox, B., Temme, L., Huybrechts, I., & Van Oyen, H. (2007). *De Belgische voedselconsumptiepeiling 2004: voedingsgewoonten van de Belgische bevolking ouder dan 15 jaar*. Brussel: Wetenschappelijk Instituut Volksgezondheid.
- Dietz, T., Frisch, A. S., Kalof, L., Stern, P. C., & Guagnano, G. A. (1995). Values and vegetarianism: An exploratory analysis. *Rural Sociology*, *60* (3), 533-542.
- Filippi, M., Riccitelli, G., Falini, A., Di Salle, F., Vuilleumier, P., Comi, G., & Rocca, M. A. (2010). The brain functional networks associated to human and animal suffering differ among omnivores, vegetarians and vegans. *PloS one*, *5* (5), e10847.

Forestell, C. A., Spaeth, A. M., & Kane, S. A. (2012). To eat or not to eat red meat. A closer look at the relationship between restrained eating and vegetarianism in college females. *Appetite*, *58*, 319-325.

Fox, N., & Ward, K. (2008). Health, ethics and environment: A qualitative study of vegetarian motivations. *Appetite*, *50*, 422-429.

Graham, J., Haidt, J., & Nosek, B. A. (2009). Liberals and conservatives rely on different sets of moral foundations. *Journal of Personality and Social Psychology*, *96*, 1029-1046.

Graham, J., Nosek, B. A., Haidt, J., Iyer, R., Koleva, S., & Ditto, P. H. (2011). Mapping the moral domain. *Journal of Personality and Social Psychology*, *101*, 366-385.

Greene-Finestone, L. S., Campbell, M. K., Evers, S. E., & Gutmanis, I. A. (2008). Attitudes and health behaviours of young adolescent omnivores and vegetarians: A school-based study. *Appetite*, *51* (1), 104-110.

Grigg, D. (1993). The European Diet - Regional Variations in Food-Consumption in the 1980S. *Geoforum*, *24*, 277-289.

Gurven, M., Hill, K., Kaplan, H., Hurtado, A., & Lyles, R. (2000). Food transfers among Hiwi foragers of Venezuela: Tests of reciprocity. *Human Ecology*, *28*, 171-218.

Haidt, J., & Graham, J. (2009). Planet of the Durkheimians, Where Community, Authority, and Sacredness are Foundations of Morality. In J. Jost, A. C. Kay, & H. Thorisdottir (Eds.), *Social and Psychological Bases of Ideology and System Justification* (pp. 371-401). New York: Oxford.

Haidt, J. & Joseph, C. (2004). Intuitive ethics: how innately prepared intuitions generate culturally variable virtues. *Daedalus*, *133*, 55-66.

Hawkes, K. (2001). Is meat the hunter's property? Big game, ownership, and explanations of hunting and sharing. In C.B. Stanford & H. T. Bunn (Eds.), *Meat-eating and Human Evolution* (pp. 219-236). Oxford: Oxford University Press.

Herzog, H. A., Betchart, N. S., & Pittman, R. (1991). Gender, sex role identity and attitudes toward animals. *Anthrozoos*, 4, 184-191.

Hill, K. (2002). Altruistic cooperation during foraging by the ache, and the evolved human predisposition to cooperate. *Human Nature-An Interdisciplinary Biosocial Perspective*, 13, 105-128.

Hoek, A. C., Luning, P. A., Stafleu, A., & de Graaf, C. (2004). Food-related lifestyle and health attitudes of Dutch vegetarians, non-vegetarian consumers of meat substitutes, and meat consumers. *Appetite*, 42, 265-272.

Kalof, L., Dietz, T., Stern, P. C., & Guagnano, G. A. (1999). Social psychological and structural influences on vegetarian beliefs. *Rural Sociology*, 64 (3), 500-511.

Kline (1999). *Handbook of Psychological Testing* (2nd ed.) Routledge, New York.

Latvala, T., Niva, M., Makela, J., Pouta, E., Heikillä, J., Kotro, J., & Forsman-Hugg, S. (2012). Diversifying meat consumption patterns: Consumers' self-reported past behaviour and intentions for change. *Meat Science*, 92 (1), 71-77.

Lea, E., & Worsley, A. (2003a). Benefits and barriers to the consumption of a vegetarian diet in Australia. *Public health nutrition*, 6 (5), 505-511.

Lea, E. & Worsley, A. (2003b). The factors associated with the belief that vegetarian diets provide health benefits. *Asia Pacific Journal of Clinical Nutrition*, 12, 296-303.

Lee, R. B. & DeVore, I. (1968). *Man the hunter*. Transaction Publishers. Rutgers, NY: Transaction Publishers.

Lenaerts, T. (2011, April 21). *1 op 2 Vlamingen wil minder vlees eten.*

[http://www.evavzw.be/index.php?option=com_content&view=article&id=1025.](http://www.evavzw.be/index.php?option=com_content&view=article&id=1025)

Mameli, M. (2013). Meat made us moral: A hypothesis on the nature and evolution of moral judgment. *Biology & Philosophy*, *28*, 903-931.

Mauquoy, L. (1960). The development of the meat trade in Belgium in 1959. *Revue Agricole*, *13*, 579-607.

Miranda-de la Lama, G., Sepulveda, W. S., Villaroel, M., & Maria, G.A. (2013). Attitudes of meat retailers to animal welfare in Spain. *Meat Science*, *95*, 569-575.

Patton, J. Q. (2005). Meat sharing for coalitional support. *Evolution and Human Behavior*, *26*, 137-157.

Preylo, B. D., & Arikawa, H. (2008). Comparison of Vegetarians and Non-Vegetarians on Pet Attitude and Empathy. *Anthrozoos*, *21*, 387-395.

Richardson, N. J., MacFie, H. J. H., & Shepherd, R. (1994). Consumer attitudes to meat eating. *Meat Science*, *36*, 57-65.

Rizzo, N. S., Jaceldo-Siegl, K., Sabate, J., & Fraser, G. E. (2013). Nutrient Profiles of Vegetarian and Nonvegetarian Dietary Patterns. *Journal of the Academy of Nutrition and Dietetics*, *113*, 1610-1619.

Rothgerber, H. (2013). Real men don't eat (vegetable) quiche: Masculinity and the justification of meat consumption. *Psychology of Men & Masculinity*, *14* (4), 363.

Rozin, P., Markwith, M., & Stoess, C. (1997). Moralization and becoming a vegetarian: The transformation of preferences into values and the recruitment of disgust. *Psychological Science*, *8*, 67-73.

- Ruby, M. B. (2012). Vegetarianism. A blossoming field of study. *Appetite*, *58* (1), 141-150.
- Ruby, M. B. & Heine, S. J. (2011). Meat, morals, and masculinity. *Appetite*, *56*, 447-450.
- Ruby, M. B., Heine, S. J., Kamble, S., Cheng, T. K., & Waddar, M. (2013). Compassion and contamination: Cultural differences in vegetarianism. *Appetite*, *71* (1), 340-348.
- Scholliers, P. (2013). Food recommendations in domestic education, Belgium 1890-1940. *Paedagogica Historica*, *49*, 645-663.
- Stanford, C. B., & Bunn, H. T. (2001). *Meat-eating and human evolution*. Oxford: Oxford University Press.
- Stein, R. I. & Nemeroff, C. J. (1995). Moral overtones of food - Judgments of others based on what they eat. *Personality and Social Psychology Bulletin*, *21*, 480-490.
- Tobler, C., Visschers, V. H., & Siegrist, M. (2011). Eating green. Consumers' willingness to adopt ecological food consumption behaviors. *Appetite*, *57* (3), 674-682.
- Troy, D. J., & Kerry, J. P. (2010). Consumer perception and the role of science in the meat industry. *Meat Science*, *86*, 214-226.
- Van Caneghem, S., Verschraegen, M., De Keyzer, W., & Huybrechts, I. (2010). Belgian city goes vegetarian on Thursday. In In 4th DIETS conference: Improving the nutrition of Europe through a fully evidenced based profession of dietetics. Thematic Network for Dietetics.
- Vanhonacker, F., Van Loo, E.J., Gellynck, X., & Verbeke, W. (2013). Flemish consumer attitudes towards more sustainable food choices. *Appetite*, *62*, 7-16.
- Vartanian, L. R., Herman, C. P., & Polivy, J. (2007). Consumption stereotypes and impression management: How you are what you eat. *Appetite*, *48*, 265-277.

Verbeke, W., & Viaene, J. (1999). Beliefs, attitude and behaviour towards fresh meat consumption in Belgium: empirical evidence from a consumer survey. *Food Quality and Preference*, 10, 437-445.

Verbeke, W., & Viaene, J. (2000). Ethical challenges for livestock production: Meeting consumer concerns about meat safety and animal welfare. *Journal of Agricultural & Environmental Ethics*, 12, 141-151.

ACCEPTED MANUSCRIPT

Highlights

- Meat consumption played a crucial role in the evolution of human morality.
- Social perception studies show that vegetarians are regarded most virtuous today.
- This study investigates the relation between meat consumption and moral attitudes.
- Vegetarians are most and meat eaters are least concerned about animal welfare.
- Harm/care distinguishes vegetarians from flexitarians.
- Authority/respect distinguishes full-time meat eaters from flexitarians.
- Vegetarians donate more often to animal oriented charities compared to meat eaters and flexitarians.

Table 1 Socio-demographic characteristics of the sample

	% of total
Gender	
<i>Male</i>	38
<i>Female</i>	62
Age Group	
<i>Mean (SD)</i>	34.40 (12.58)
<i>18-30</i>	54.5
<i>31-45</i>	26.4
<i>46+</i>	18.7
Education	
<i>Secondary school</i>	40.8
<i>High school/University</i>	58.6
Eating diet	
<i>Meat eater</i>	30.1
<i>Flexitarian</i>	27.8
<i>Vegetarian</i>	42.1

Table 2 Animal welfare attitudes to predict diet choice

	B(SE)	95% CI for Odds Ratio		
		Lower	Odds Ratio	Upper
Vegetarian vs. flexitarian				
Intercept	-11.25 (1.60)***			
Animal welfare attitudes	2.90 (.40)***	8.33	18.12	39.39
Meat eater vs. flexitarian				
Intercept	5.82 (1.25)***			
Animal welfare attitudes	-1.64 (.35)***	.10	.19	.39

Note: $R^2 = .47$ (Cox & Snell), $.54$ (Nagelkerke). Model $\chi^2(2) = 189.65$, $p < .001$.

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 3 Human concern attitudes to predict diet choice

	B(SE)	95% CI for Odds Ratio		
		Lower	Odds Ratio	Upper
Meat eater vs. flexitarian				
Intercept	-4.58 (1.73)**			
Harm/care	.36 (.42)	.63	1.44	3.26
Fairness/reciprocity	-.01 (.44)	.42	.99	2.36
Ingroup/loyalty	-.07 (.36)	.46	.94	1.91
Authority/respect	1.27 (.35)***	1.79	3.57	7.12
Purity/sanctity	-.11 (.34)	.46	.89	1.74
Vegetarian vs. flexitarian				
Intercept	-1.98 (1.52)			
Harm/care	1.54 (.39)***	2.20	4.67	9.92
Fairness/reciprocity	-.62 (.40)	.24	.54	1.19
Ingroup/loyalty	-.54 (.35)	.29	.58	1.16
Authority/respect	-.23 (.33)	.42	.80	1.52
Purity/sanctity	.31 (.31)	.75	1.37	2.51

Note: $R^2 = .22$ (Cox & Snell), $.25$ (Nagelkerke). Model $\chi^2(10) = 73.95, p < .001$.

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 4 - Correlations between diet choice and donations to human- and animal/nature oriented charities

	Meat eaters	Flexitarians	Vegetarians
Did not donate	36.6%	26.3%	14.3%
	(34)	(25)	(22)
Human-oriented charities	54.8%	60.0%	51.3%
	(51)	(57)	(79)
Animal/nature-oriented charities	8.6%	13.7%	34.4%
	(8)	(13)	(53)
	100%	100%	100%