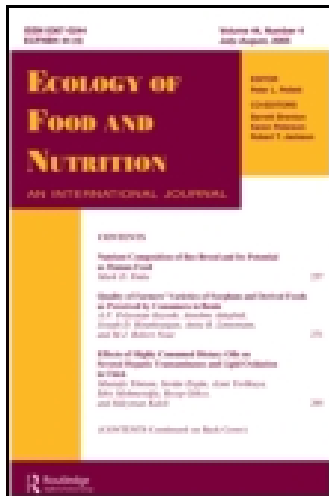


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### From Meatless Mondays to Meatless Sundays: Motivations for Meat Reduction among Vegetarians and Semi-vegetarians Who Mildly or Significantly Reduce Their Meat Intake

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# **From Meatless Mondays to Meatless Sundays: Motivations for Meat Reduction among Vegetarians and Semi-vegetarians Who Mildly or Significantly Reduce Their Meat Intake**

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*This study explores vegetarians' and semi-vegetarians' motives for reducing their meat intake. Participants are categorized as vegetarians (remove all meat from their diet); semi-vegetarians (significantly reduce meat intake: at least three days a week); or light semi-vegetarians (mildly reduce meat intake: once or twice a week). Most differences appear between vegetarians and both groups of semi-vegetarians. Animal-rights and ecological concerns, together with taste preferences, predict vegetarianism, while an increase in health motives increases the odds of being semi-vegetarian. Even within each group, subgroups with different motives appear, and it is recommended that future researchers pay more attention to these differences.*

**KEYWORDS** *meat reduction, public health campaigns, semi-vegetarianism, vegetarianism*

During World War I, “Meatless Mondays” and “Wheatless Wednesdays” were introduced to save the countries at war from starvation and to support the troops. By reducing their meat and wheat intake, people could improve the quality of life of others, show their respect, and be a team player. Today, Meatless Mondays are part of Johns Hopkins’ Bloomberg School of Public Health’s campaign to reduce meat consumption for reasons of personal and

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ecological well-being. Inspired by this Meatless Mondays campaign, a similar public health campaign was successfully launched in 2009 in Flanders (the Dutch-speaking part of Belgium), with the support of Ethical Vegetarian Alternative (EVA), a non-profit organization that promotes vegetarian diets in Flanders. It was called “Donderdag Veggiedag,” which translates to “Meatless Thursdays”. The campaign had a successful start, with some schools deciding to offer vegetarian lunches on Thursdays (Van Caneghem et al. 2010).

Yet overall, Belgium, and especially Flanders, remains characterized by heavy meat consumption, as has long been the case in this region. In 2011, EVA conducted a survey in Flanders to investigate how many people are vegetarian or semi-vegetarian. According to their results, 1.5% of the Flemish population was vegetarian at that point, while 11.6% of the population considered themselves semi-vegetarian (Lenaerts 2011). Accordingly, the aim of this study is to explore why some individuals are choosing to reduce their meat intake, when the majority of the population is not.

This paper contributes to the literature on meat reduction and vegetarianism (e.g., Jabs, Devine, and Sobal, 1998; Rozin, Markwith, and Stoess 1997) by: (1) investigating the differential impacts of both personal and moral motives on dietary choices; (2) differentiating between vegetarians who remove all meat from their diet, semi-vegetarians who mildly reduce their meat intake, and semi-vegetarians who strongly reduce their meat intake; and (3) investigating if and how motives for reducing meat intake are interrelated within each diet group.

In sum, the purpose of this study is to investigate the motives underlying the different forms of vegetarianism and semi-vegetarianism in a culture where meat continues to play a crucial role in people’s diets. Before discussing the results of our large-scale survey study that explored Flemish consumers’ motives for reducing meat intake, we will provide an overview of the relevant literature on people’s motives for adopting partial or full vegetarianism, followed by a discussion of the eating habits of Flemish consumers.

## MOTIVES FOR MEAT REDUCTION

Today, meat products are so readily available that the decision to reduce one’s meat consumption can only be driven by conscious motives (Beardsworth and Keil 1993). These motives can be personal—aiming for personal well-being—or driven by morals—by a clear concern for the well-being of others. Regarding the former, among the more personal motives for meat reduction, *health motives* appear to be important (Rozin et al. 1997). Semi-vegetarians, or people who reduce, but not entirely stop, their meat intake, lean mostly towards health motives (Forestell, Spaeth, and Kane 2012; Fox and Ward 2008; Hoek, Luning, Stafleu, and de Graaf 2004; Lea and

Worsley 2003b). Cutting back on meat is an important aspect of a healthy diet for many individuals (Allen et al. 2000). Often, health-conscious vegetarians achieve their health goals not just through their dietary choices, but also through a range of other lifestyle choices (Hoek et al. 2004). Vegetarians smoke and drink less, and do more sports, which all contribute to lower body mass index scores when compared to non-vegetarians (Appleby et al. 1998; Spencer et al. 2003). Also, compared to non-vegetarians, vegetarians are more likely to seek out information about healthy diets and lifestyles (Lea and Worsley 2004). Along with the general aim of achieving a healthy lifestyle, this focus on health includes the desire to lose weight by reducing meat intake (Forestell et al. 2012; Gilbody, Kirk, and Hill 1999). Weight-loss motives are especially prevalent in women and younger people (Gilbody et al. 1999; Smith, Burke, and Wing 2000). In extreme cases, some women even use this motive as a socially accepted reason to remove meat from their diet, and thus disguise an eating disorder (Bardone-Cone et al. 2012; Hansson et al. 2011; Klopp, Heiss, and Smith 2003). In particular, semi-vegetarians seem to be more likely to employ “false” motives for vegetarianism (Timko, Hormes, and Chubski 2012).

Second, and also classified among personal motives for vegetarianism, are *taste preferences*. This motive refers to how much individuals like or dislike the taste of meat and meat substitutes. It is known from previous research that, next to a general reluctance to change their diet, “loving the taste of meat” is the most significant factor among men and women of all ages who are reluctant to reduce their meat consumption (Lea and Worsley 2003a). “Missing the taste of meat” is a common reason for vegetarians to switch back to a diet including meat (Barr and Chapman 2002). In this study, we will not focus on these barriers to vegetarianism, but rather explore if taste preferences for vegetarian alternatives and taste aversion for meat can predict the dietary choices of (semi-)vegetarians. Different motives may be behind both. For instance, some have a distaste for meat because of their knowledge of its origin, while others dislike meat because of its taste, smell, or texture, or because they believe it might be harmful to their health (Hamilton 2006; Rozin and Fallon 1980). As we argue below, animal rights concerns have so far mainly been linked to a vegetarian diet, and meat aversion among this group might be closely connected to general concerns for animal welfare. Yet, given the fact that health is an important consideration for semi-vegetarians, as argued above, it can also be expected that this will translate into meat aversion in this group.

Regarding *moral motives* for meat reduction, several studies have shown how normative and humanist views of the world are closely connected to food choice in general. In particular, environmental and animal rights issues seem to influence what humans eat (Honkanen and Verplanken 2006; Lindeman and Sirelius 2001), and the extent to which they exclude meat from their diet. The *ecological drive* for vegetarianism has been documented

as the most often listed reason for becoming vegetarian, next to health (Rozin et al. 1997). This drive refers to an individual's concern for the environment and how meat consumption affects the environment. This is based on the fact that meat consumption strongly increases one's ecological footprint due to, for instance, the greenhouse gas emissions related to meat production (Fiala 2008), as well as one's water footprint, because of the intensive use of water in the meat production process (Hoekstra 2009).

Next to ecological concerns, *concerns for animal welfare* also strongly influence decisions not to eat meat (Dietz et al. 1995; Fox and Ward 2008; Kalof et al. 1999). Vegetarians driven by this motive believe it is unethical or even unacceptable to kill animals for the purpose of human consumption. As a result, this group of vegetarians is often referred to as "ethical" or "moral". Their motives are most clearly embedded in an ideological framework. They feel morally obliged not to kill or hurt animals, and are distressed by the fact that other people do not share these feelings (Rozin et al. 1997). In comparison to vegetarians who are driven by health motives, vegetarians driven by animal-rights concerns will not "sin" by occasionally abandoning their diet and consuming meat in exceptional circumstances.

Finally, another motive for meat reduction is *religion*. Several religions restrict the intake of certain foods, especially meat (Kim et al. 2008; Nath 2010; Ockerman and Nxumalo 1998). Some people state that their religion informs their ethical and moral choices relating to the food they eat (Lindeman and Vaananen 2000).

## EATING HABITS IN FLANDERS

This section will describe the eating habits of Flemish people, and briefly look at the history of Belgian cuisine. In Belgium, meat was considered to be part of the ideal diet up to 1914, despite the fact that it was a costly item. After 1925, sugar and butter gained popularity as energy foods, and recommendations were given to lower meat intake, despite the fact that meat had become more accessible to most people by 1940 (Scholliers 2013). In the 1960s, meat consumption was still on the rise, and the production of meat in Belgium was growing, especially with regards to beef (Bublöt 1961; Mauquoy 1960). In the following decades, meat consumption in Belgium remained high—so much so that the country was among the biggest meat consumers in Europe. The most commonly consumed meats were pork, beef, and poultry (Grigg 1993).

After decades of growth, meat consumption began to decline in the 1990s in most European countries, including Belgium. This was driven by a mix of factors, including health concerns, risk perceptions, and changing tastes (Verbeke and Viaene 2000). Investigating consumer demands for fresh meat in Flanders in the late 1990s, Verbeke and Viaene (1999 2000) noticed

that meat consumption had decreased mainly because of personal health concerns, and not so much because of animal-rights concerns. Yet, when inquiring about future plans to reduce meat intake, the authors concluded that animal welfare would gain importance. In the years 2000–2006, Flemish citizens' attitudes toward animal welfare were further analyzed. The results revealed that while people indicated that animal welfare was an important product attribute, it was still rated as less important than quality, health, and safety (Vanhonacker et al. 2010).

At the same time, Belgians, and Flemish people in particular, remained heavy meat consumers, as reported by the most recent Belgian Food Consumption Survey, conducted in 2004 (Debacker et al. 2007). By means of a survey (food-frequency questionnaire) and two 24-hour food diaries (completed by dieticians visiting the homes of each of the 3,200 respondents), this study conducted an in-depth investigation on the eating patterns of Belgians aged 15 and above. According to this study, more than half of the Belgian population (56.3 %) eats meat at least once a day. In Flanders, the northern region of Belgium where the research for this study was conducted, meat consumption is high: The majority of people (64.9%) eat meat once or more per day, 15% eat meat 5–6 times a week, and another 14.8% eat meat on a weekly basis. Only a very small fraction (1.5%) of the Flemish population report never eating any meat. This result remained the same in 2011, when EVA conducted their survey (Lenaerts 2011). In addition to these survey results, the food diary results revealed that 3.9% of the respondents had not eaten any meat during the days studied. Regarding the consumption of meat replacement products, the report mentioned that although meat consumption is high, many Belgians occasionally eat meat replacement products. The majority (90.5% in Belgium and 90.2% in Flanders) eat vegetarian foods 2–4 times a week, while the minority eat meat substitutes 5–6 times per week (3.2% in Belgium and 3.0% in Flanders), or daily (6.3% in Belgium and 6.8% in Flanders). According to the results of the diary data, 83.3% of all respondents had not eaten any meat-replacement products during the studied days. Overall, these consumption patterns indicate that initiatives such as Meatless Thursdays are still not affecting most of the Flemish population.

As a final note, we wish to highlight the fact that despite the clear popularity of meat in Belgian cuisine, meatless days have long been part of Belgian culture, and the Meatless Thursdays campaign idea is not new. This is because of the Christian religious tradition in Belgium and the Netherlands. On Meatless Fridays (van Dam 2009), Christians skip meat and eat fish or vegetables instead, in remembrance of Jesus, who was crucified on a Friday. In Belgium, Catholicism still has a noticeable influence on individual preferences, such as political views (Botterman and Hooghe 2012), but it is not known how much religious factors still influence dietary choices. The Meatless Thursdays program launched by EVA is unrelated to this religious tradition. While Saturdays and Wednesdays have been kept meat-free by



some Catholic minorities in Belgium (van Dam 2009), no records could be found of Thursdays being kept meat-free for religious reasons.

## METHOD

An online survey was conducted to explore people's motives for meat reduction. The survey was posted online for a period of eight weeks. To recruit respondents who had reduced their meat intake, we put a link to the survey on EVA's website. No reference was made to the Meatless Thursdays campaign in the survey. In addition, by taking part and completing the survey, respondents entered a competition to win a movie ticket. This study was carried out in full compliance with the University's guidelines for research involving human subjects. All respondents were informed about the study's general aims, their anonymity was guaranteed, and their full consent was obtained.

### Sample

A total of 2,142 Flemish respondents started the survey, out of which 131 did not complete the questionnaire. In addition, 455 respondents who indicated they ate meat on a daily basis (and thus had not reduced their meat intake) were directly guided to the end of the survey, and thus omitted from the analyses. This left us with a total of 1,556 respondents (76% women,  $M_{age} = 26.12$ ,  $SD = 8.92$ ). Based on the question "How often do you eat meat per week?" we classified respondents into three categories: 165 respondents (10.6%) were *vegetarians* (never eat meat), 650 (41.8%) were *semi-vegetarians* (strongly reduced meat intake), and 741 (47.6%) were *light semi-vegetarians* (avoid meat one or two days a week).

### Measures

First, the respondents needed to indicate how often they consumed meat per week. All fulltime meat-eaters were excluded from the next part, which asked the respondents to indicate their motives for meat reduction/avoidance. These motives were measured with 10 items, covering the 5 most important motives for meat reduction identified in the literature.

First, health concerns were measured with the items: "I don't eat meat every day because I want to lose weight," and "I don't eat meat every day because I care about healthy food".

Next, taste preferences were measured with the items: "I don't eat meat every day because I don't like the taste of meat," and "I don't eat meat every day because I like the taste of vegetarian meals".



Religious motives were measured with the items: “*I don't eat meat every day because my religion does not allow me to eat certain types of meat,*” and “*I don't eat meat every day because my religion does not allow me to eat meat*”. Religious motives were not further specified, so that all religions could be included.

Animal-rights concerns were measured with the items: “*I don't eat meat every day because I defend animal rights,*” and “*I don't eat meat every day because animals need to be killed for food*”.

Finally, ecological concerns were measured with the items: “*I don't eat meat every day because it is better for the environment,*” and “*I don't eat meat every day because eating meat increases my ecological footprint*”.

For each item, the respondents had to indicate the extent to which they agreed with the item on a 7-point Likert scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The motives were presented in an automated, randomized order to respondents.

A principal component analysis, using oblique rotation, revealed that the 10 items could be grouped into 4 underlying dimensions, explaining a total of 74.2% of the variance. Kaiser-Meyer-Olkin measure of sampling adequacy = .75, Bartlett's test of sphericity  $\chi^2(45) = 6910$ ,  $p < .001$  (see [table 1](#)). The first factor contained the four items that referred to the moral motives for meat reduction. Within this dimension, the two items that referred to animal-rights concerns were most strongly correlated,  $r = .81$ ,  $p < .001$ , as

**TABLE 1** Summary of Exploratory Principal Components Analysis

Motive for meat reduction	I don't eat meat every day because. . .	Factor 1 Ecological/ Animal concern	Factor 2 Religion	Factor 3 Health	Factor 4 Taste
Ecological concern	. . .this is better for the environment	.93	-.01	.07	-.13
	. . .eating meat increases my ecological footprint	.91	-.01	.07	-.14
Animal concern	. . .I defend animal rights	.83	.07	-.09	.12
	. . .animals need to be killed for food	.80	.05	-.09	.20
Religious motives	. . .my religion not allows me to eat certain types of meat	-.01	.86	-.04	.03
	. . .my religion not allows me to eat meat	.10	.86	.09	-.03
Health motives	. . .I want to lose weight	-.19	.11	.87	.03
	. . .I care about healthy food	.29	-.11	.65	-.01
Taste preferences	. . .I don't like taste of meat	-.07	.04	-.02	.95
	. . .I like the taste of vegetarian meals	.41	-.09	.22	.46
	Eigenvalues	3.75	1.54	1.11	1.02
	% of variance explained	37.55	15.38	11.07	10.19

well as the two items that referred to ecological concerns,  $r = .90$ ,  $p < .001$ . Similar to previous studies (e.g., Fox and Ward 2008), we treated these motives as separate motives and did not group them together as one factor for the further analyses. The second factor contained two items that referred to religious motives,  $r = .50$ ,  $p < .001$ ). The third factor contained two items that referred to health motives,  $r = .24$ ,  $p < .001$ . The fourth and final factor contained two items that referred to taste preferences,  $r = .34$ ,  $p < .001$ . However, the item “*I don't eat meat on a daily basis because I like the taste of vegetarian meals*” also loaded on the first factor. The factor analysis revealed that all of the other items clearly loaded on one of the four factors.

## RESULTS

A multinomial logistic regression analysis was conducted to investigate whether the dietary choices of the respondents could be predicted based on these motives (see table 2). The semi-vegetarian 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,  $\chi^2(10) = 654.29$ ,  $p < .001$ . Well over half (62.5%) of the cases could be correctly classified based on these variables, which is more than can be expected by chance. The percentage of cases that were correctly classified was 58.8% for vegetarians, 51.2% for semi-vegetarians, and 73.3% for light semi-vegetarians.

**TABLE 2** Results of Multinomial Logistic Regression Measuring the Predictive Value of Meat-reduction Motives on Diet Choice, with Semi-vegetarians as Reference Category

	95% CI for Odds Ratio			
	B (SE)	Lower	Odds Ratio	Upper
Vegetarian versus semi-vegetarian				
Intercept	-4.91 (.54)***			
Animal concern	.72 (.08)***	1.77	2.05	2.38
Ecological concern	.33 (.07)***	1.20	1.39	1.60
Health motives	-.49 (.10)***	.51	.61	.74
Taste preferences	.16 (.08)*	1.01	1.17	1.36
Religious motives	-.11 (.15)	.67	.89	1.19
Light vegetarian versus semi-vegetarian				
Intercept	2.03 (.22)***			
Animal concern	-.18 (.05)***	.76	.83	.91
Ecological concern	-.03 (.03)	.91	.97	1.04
Health motives	-.07 (.05)	.86	.94	1.02
Taste preferences	-.36 (.04)***	.64	.70	.76
Religious motives	-.13 (.12)	.70	.88	1.11

Note.  $R^2 = .34$  (Cox and Snell);  $.40$  (Nagelkerke); Model  $\chi^2(10) = 654.29$ ,  $p < .001$ .

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

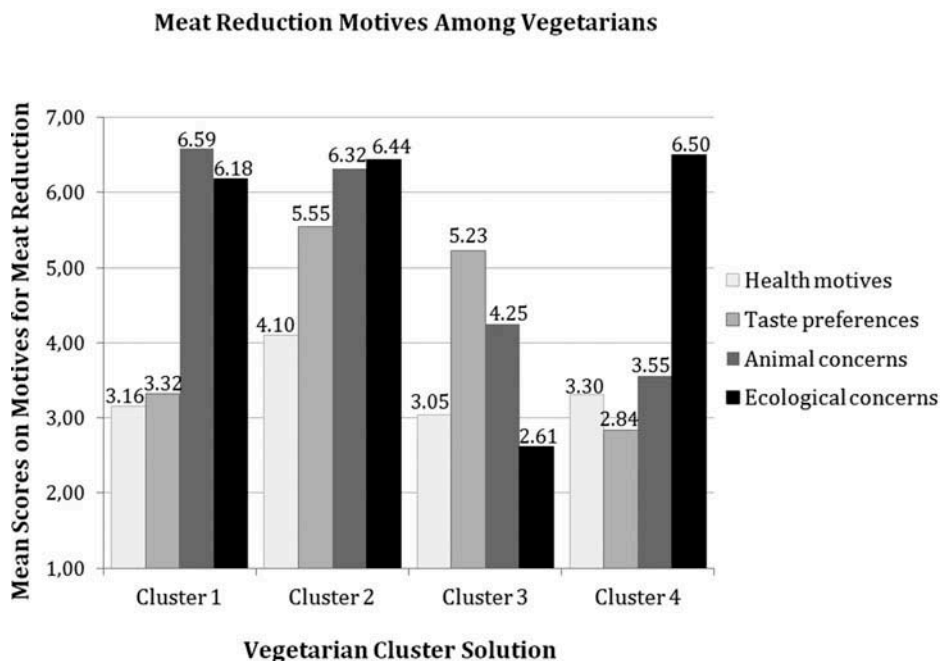
Overall, the results showed that only religion was not significantly related to diet,  $\chi^2(2) = 1.62, p = .45$ . The other motives appeared to be significant predictors of diet, including: health,  $\chi^2(2) = 27.97, p < .001$ ; tastes,  $\chi^2(2) = 94.47, p < .001$ ; ecological concerns,  $\chi^2(2) = 24.80, p < .001$ ; and animal rights concerns,  $\chi^2(2) = 173.44, p < .001$ .

First, an in-depth analysis on which motives distinguished vegetarians from semi-vegetarians revealed that for each unit increase in health motives, the odds of being in the vegetarian group decreased by 39%. Next, for each unit increase in taste motives, the odds of being in the vegetarian group increased by 17.4%. For each unit increase in animal rights concerns, the odds of being in the vegetarian group increased by 105.3%. Finally, for each unit increase in ecological concerns, the odds of being in the vegetarian group increased by 38.9%.

Second, an in-depth analysis on which motives distinguished light semi-vegetarians from semi-vegetarians revealed that for each unit increase in taste motives, the odds of being in the light semi-vegetarian group decreased by 30.3%. Next, for each unit increase in animal-rights concerns, the odds of being in the light semi-vegetarian group decreased by 16.8%. For each unit increase in health and ecological concerns, no significant changes in odds were observed. The details of these results are listed in [Table 2](#).

To conclude, a cluster analysis was conducted for each diet, based on the four motives that significantly predict dietary choices (health motives, taste preferences, animal-rights concerns, and ecological concerns). This was to investigate whether respondents within each diet group differed from each other in regard to their motives for meat reduction. First, a hierarchical cluster analysis using Ward's method revealed that a two cluster solution was the best solution for semi-vegetarians and light semi-vegetarians, and a four cluster solution was the best solution for vegetarians. Next, a k-means cluster analysis was conducted for each diet group to determine which motives respondents within each cluster had for meat reduction. First, for vegetarians (see [figure 1](#)), the biggest cluster (cluster 1,  $n = 64$ ) consisted of respondents who were mainly driven by moral motives for meat reduction (i.e., ecological and animal-rights concerns). Health and taste motives appeared to be less important for this cluster. Next, the second cluster ( $N = 51$ ) consisted of respondents for whom dietary choice was driven by a mix of animal-rights concerns and health and taste motives. Ecological concerns were the least important motive for this cluster. The two smaller clusters consisted of respondents for whom taste (dislike meat, like vegetarian alternatives) and animal-rights concerns were the most important motives for meat reduction (cluster 3,  $n = 22$ ), and respondents whose dietary choices were mainly driven by their concern for the environment (cluster 4,  $N = 28$ ).

Next, for semi-vegetarians (see [figure 2](#)), the first cluster consisted of respondents who were mainly driven by personal motives for meat reduction (health and taste,  $n = 327$ ), and the second cluster consisted of respondents

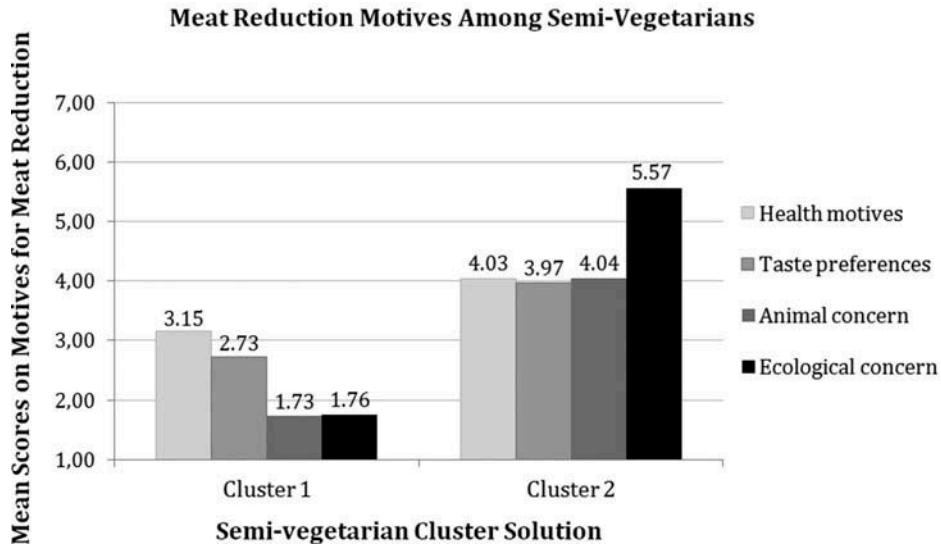


**FIGURE 1** Meat-reduction motives among vegetarians. *Note.* This figure shows the average scores for health motives, taste preferences, animal concerns, and ecological concerns within each of the four clusters that appeared in the vegetarian diet group. Vegetarians are people who indicated that they never eat any meat. Respondents were asked to indicate how important they rated each motive for reducing their meat intake on 1–7 Likert scales, with 1 being “not at all” to 7 being “very important.”

who were driven by a mix of all personal and moral motives, and with ecological concerns as the most important motivator ( $n = 323$ ). Finally, for light semi-vegetarians (see figure 3), the biggest cluster consisted of respondents who were mainly driven by health motives to reduce their meat intake ( $n = 487$ , cluster 1). The other cluster consisted of respondents who were mainly driven by their concern for the environment ( $n = 254$ , cluster 2).

## DISCUSSION

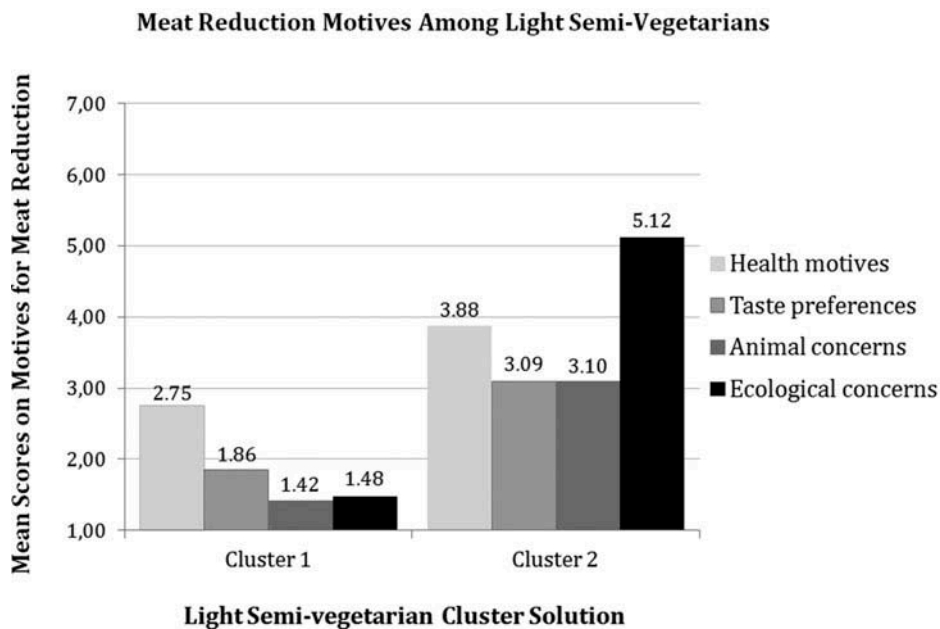
This study investigated which diet motives can best predict a vegetarian or semi-vegetarian diet in current-day Flanders, where meat consumption has a strong tradition. As an innovative component, the semi-vegetarian group was split into two groups, based on the frequency of meat intake. Those eating meat two days a week or less (semi-vegetarians) were separated from those eating meat three days a week or more (light semi-vegetarians). In line with previous studies (Fox and Ward 2008; Lea and Worsley 2003a, 2003b, 2004;



**FIGURE 2** Meat-reduction motives among semi-vegetarians. *Note.* This figure shows the average scores for health motives, taste preferences, animal concerns, and ecological concerns within each of the four clusters that appeared in the semi-vegetarian diet group. Semi-vegetarians are people that indicated to not eat meat at least three times a week. Respondents were asked to indicate how important they rated each motive for reducing their meat intake on 1–7 Likert scales, with 1 being “not at all” to 7 being “very important.”

Rozin et al. 1997), we investigated the relation between dietary choices and several distinct motivations: health motives, taste preferences, animal-rights concerns, ecological concerns, and religious motives. Each motive was measured using two items. Yet, when looking at the results of the principal component analyses, we noticed that animal-rights and ecological concerns fell under one category in the sample. All other items could be clustered into the three remaining motivations (health, taste, and religion), as expected. To allow for comparisons with previous research, animal-rights and ecological concerns were kept as separate motivations. However, it is recommended that a future study follows up on this to investigate if and how these motives should be separated.

Next, the main analyses looked at both the group-level differences between vegetarians, light semi-vegetarians, and semi-vegetarians, and the within-group differences for each of these diet groups. The between-group analyses indicated that religious motives cannot predict dietary choices, and appear to be of minor importance to all groups—at least compared to the other motives for meat reduction. Thus, while in Belgium Catholicism may still influence certain individual preferences (Botterman and Hooghe 2012), religion hardly influenced dietary choices in our sample. In contrast, the multinomial logistic regression analysis revealed that all other motives



**FIGURE 3** Meat-reduction motives among light semi-vegetarians. *Note.* This figure shows the average scores for health motives, taste preferences, animal concerns, and ecological concerns within each of the four clusters that appeared in the vegetarian diet group. Light semi-vegetarians are people that indicated to not eat meat once or twice a week. Respondents were asked to indicate how important they rated each motive for reducing their meat intake on 1–7 Likert scales, with 1 being “not at all” to 7 being “very important.”

appeared to be significant predictors of dietary choices. To start with health motives, the results of the multinomial logistic regression showed that the more one is concerned about his/her health, the more likely they belong to the semi-vegetarian group. This is in line with previous findings that health motives are of particular importance among semi-vegetarians (Fox and Ward 2008; Forestell et al. 2012; Hoek et al. 2004; Lea and Worsley 2003a, 2003b). In addition, the results indicated that changes in health preference scores do not predict whether one will opt for a semi-vegetarian diet versus a light semi-vegetarian diet. This implies that if flexible meat eaters need to be convinced, or reaffirmed, of the importance of a lower meat intake, health claims might be appealing. Yet, since fulltime meat eaters were not included in this study, no solid conclusions about the success of health claims in public health campaigns promoting a reduced meat intake can be made. Also, it should be noted that it has been shown that health claims are not the optimal way to convince heavy meat consumers to lower their meat intake (Hoek et al. 2011).

Next, with regards to taste preferences, the more one dislikes the taste of meat and likes the taste of vegetarian alternatives, the more likely they are to

adhere to a vegetarian diet, and remove all meat from their food intake. This study showed that a taste aversion towards meat sustains a vegetarian diet. In addition, the results showed that when taste preferences become more important, the odds of belonging to the light semi-vegetarian group decrease (compared to semi-vegetarians). This suggests that a stronger affinity for vegetarian alternatives may push individuals to stop or significantly reduce their meat intake (at least three times a week), while it is not an important motive for individuals who only mildly reduce their meat intake. Previous studies have focused on the opposite: how a strong taste preference for meat is a barrier to becoming a vegetarian (Barr and Chapman 2002; Lea and Worsley 2003a). It would be interesting in future research to include taste preferences (like and dislike) for both meat and vegetarian alternatives in one study.

Regarding animal-rights concerns, the results showed that the more one is concerned about animals, the more likely they are to be a fulltime vegetarian; and the less one is concerned about animals, the more likely they are to belong to the light semi-vegetarian group. Animal-rights concerns set semi-vegetarians apart from both light semi-vegetarians and vegetarians. This indicates that the more an individual is concerned about animals, the more they remove meat from their diet, which is in line with previous studies (Hamilton 2006; Loughnan, Haslam, and Bastian 2010; Rozin et al. 1997) that compared vegetarians to semi-vegetarians. The results of this study add the finding that even within the overall semi-vegetarian group, animal-rights concerns can predict differences in the amount of meat consumed on average per week.

Concerning ecological motives, the more one is concerned about the environment, the more they are likely to remove meat from their diet. The results of the logistic regression showed that an increase in ecological concerns can only predict the difference between semi-vegetarians and vegetarians, but not between semi-vegetarians and light semi-vegetarians. Thus, an increasing awareness of ecological issues might convince semi-vegetarians to remove meat entirely from their diet, but will most likely not motivate light semi-vegetarians to consume less meat.

After the differences in motives between the three diet groups, the different motives within each diet group were analyzed. To start with the vegetarian group, the results of the cluster analysis showed that, in general, personal motives (and health motives in particular) appear to be of less importance compared to moral motives for all clusters within the vegetarian diet group. This is in contrast to the findings of Rozin et al. (1997), who found that health motives were important motivators for vegetarians, next to ecological concerns. Compared with the results of the between-group analysis, this suggests that health concerns have decreased in importance (especially compared to the importance attached to moral concerns). Future research should follow up on diet motives using a longitudinal research method,



as previous studies have already indicated that animal-rights and ecological concerns are growing in importance (Schmidt, Ivanova, and Schafer 2013; Verbeke and Viaene 1999 2000). However, while ecological concerns appear to be the most important motives for the three clusters, they are the least important motive for cluster three; thus, it can be seen that ecological concerns are not that important for all vegetarians. The third cluster, for instance, is mainly motivated by taste preferences and animal-rights concerns. Cluster four is strongly motivated by ecological concerns, and much less so by the other three motives. This is in line with previous findings that not all vegetarians consider themselves animal-rights activists (Herzog and Golden 2009). These results further indicate that it is recommended to keep animal-rights and ecological concerns as separate motivations in future studies. Moreover, while it is possible to think of degrees of environmental impact, considering the killing of animals is more absolute. People are either comfortable with it or not comfortable with it. The idea of killing fewer animals is not a consideration. We therefore suggest future studies to not only keep animal-rights and ecological concerns as separate variables, but also investigate to which degree one needs to care about these aspects in order to reduce their intake of meat.

Next, the cluster analysis neatly separated the semi-vegetarian group into two equally sized subgroups. This analysis showed that while ecological concerns appear to be very important for the second cluster, they are not an important motive for the first cluster, as the dietary choices of these individuals were mainly influenced by personal motives. Finally, health motives appear to be important for both clusters within the group of light semi-vegetarians; however, the second cluster combines this motive with ecological concerns.

In conclusion, our data analyses suggest that differences emerge between vegetarians, semi-vegetarians, and light semi-vegetarians. Moreover, even within each diet group, different clusters appear, and we strongly encourage future research on vegetarianism to further describe these differences, and not treat vegetarians, semi-vegetarians, and light semi-vegetarians as one homogeneous group.

Despite its contribution to this topic, the current study does have some limitations. First, it is important to note that this study did not include the impact of psychosocial variables on dietary choices. Various studies suggest that these variables may be important determinants of food choice (e.g., McIntosh et al. 1995; Roberts and Pettigrew 2013), so future studies are encouraged to include the influence of the media, food advertisements, peers, and so on.

Next, although some studies label health and taste motives as personal motives (e.g., Fox and Ward 2008; Rozin et al. 1997), there are arguments against this decision. Considering this idea using the theory of planned behavior (Ajzen 1991), for example, it can be argued that health and taste

motives are influenced by subjective norms. It has been found, for instance, that women's intent to consume beef was strongly predicted by these subjective norms (Zey and McIntosh 1992). And, at least for health concerns, sociometer theory also supports such notions, because, according to this theory, one's self-esteem depends on how one thinks others will evaluate them (Leary et al. 1995). Health concerns, especially regarding weight loss, are closely related to worries about physical appearance (Gilbody et al. 1999; Smith et al. 2000), and these concerns about attractiveness, exacerbated by comparisons to others, end up impacting well-being (see the meta-analyses by Grabe, Ward, and Hyde 2008; Groesz, Levine, and Murnen 2002). Regarding taste, it is known that what people eat, and what they find too disgusting to eat, is culturally defined. Each culture has its own cuisine that includes certain foods and excludes others; thus, every individual choice is defined by the tastes of others (Fischler 1988). Perhaps a good way to separate the various moral drives is to say that some serve to benefit or please oneself, and others serve to benefit others. For example, health and taste motives serve to benefit the self, while animal-rights concerns clearly serve to benefit others. Yet, from this perspective, religious motives would also be seen to serve the self, and perhaps should not be labeled as "moral concerns," as others have suggested (Lindeman and Vaananen 2000). Lastly, ecological motives would combine both: Reducing meat intake to help the environment ends up serving both the self and others.

Finally, it should be noted that although we investigated the influence of various motives on dietary choices, it is best to speak of correlations and avoid any causal deductions. Firstly, our methodological design does not allow us to draw any conclusions about the causality of this relation, and experimental research is needed to further investigate this. Secondly, theories and more experimental studies from the past have given support for causality in both directions. That is, it seems that motivations influence dietary choices, and diet patterns influence (at least certain aspects of) motivations—moral motivations in particular. The causality from motivations towards dietary choices can be theoretically supported by the theory of planned behavior (Ajzen 1991). Yet, when Rozin et al. (1997) found that, compared to health vegetarians, moral vegetarians are more disgusted by meat, they concluded that disgust towards meat predicts moral beliefs. Moreover, by asking participants to eat either dried nuts or dried meat, and then asking them to indicate their moral concern for animals, Loughnan and colleagues (2010) experimentally showed that eating meat reduces moral concern towards animals. Then again, Fessler and colleagues (2003) argued the exact opposite: From an emotivist perspective, they argued, disgust for meat should be inversely correlated with meat consumption—if it were true that emotional reactions cause propositional reasoning. They could not find this relation. Moreover, meat consumption appeared to correlate positively with disgust for meat.

This again supported the notion that morality and personal motives influence dietary choices. Further experimental research is needed to clarify this.

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