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Towards a reduced meat diet: Mindset and motivation of young vegetarians, low, medium and high meat-eaters

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*Abstract*

This study provides insight into differences and similarities in the mindset and motivation of four dietary groups (young self-declared vegetarians, low, medium and high meat-eaters) to support the development of strategies for a general transition to a less meat-based diet. The paper highlights the value of the identity concept for our understanding of both vegetarians and meat eaters. The analysis involves a comparison of the four dietary groups focusing on the strength and the profile of their food-related motivation and their reasons for and against frequent meat eating. To check for the generalizability of the results, the analyses were performed in two samples of adults (aged 18-35) in the Netherlands (native Dutch, n = 357, and second generation Chinese Dutch, n = 350). In both samples, the vegetarians had the same level of food-related motivation as the other groups, but a different motivational profile and distinctive, taste- and animal-welfare related reasons to justify their abstinence from eating meat. The low and medium meat-eaters often considered health a reason to eat meat as well as to moderate meat eating, plus they liked to vary their meals. In these aspects they were different from both the vegetarians and the high meat-eaters. The findings are relevant for (non) governmental organizations that aim to influence dietary choices, as well as for businesses that operate in the market of meat substitutes.

*Keywords*

Meat, vegetarians, mindset, motivation

## Introduction

The twentieth-century nutritional transition that made livestock the chief source of protein in many countries (Grigg, 1995) is causing increasing pressures on the health of humans, animals and the planet (see Aiking, 2014; Friel et al., 2009; Westhoek et al., 2014). Experts have warned that these pressures are likely to have serious consequences for global food security and that a novel transition to a less meat-based diet is necessary (Global Panel on Agriculture and Food Systems for Nutrition, 2016). The impacts of current meat eating practices are often compared with those of vegetarian options (Berners-Lee, Hoolohan, Cammack, & Hewitt, 2012; Tilman & Clark, 2014). The latter are, in theory, highly advantageous; for instance, focusing on the greenhouse gas (GHG) emissions in the United Kingdom (UK), Berners-Lee et al. (2012) calculated that potential GHG savings of 22% and 26% can be made by changing from the current UK-average diet to a vegetarian or vegan diet, respectively. In practice, however, it is not clear how the vegetarian options can be successfully promoted in Western societies; the literature sees vegetarians and omnivores as distinct social identities whose interactions may cause troublesome inconveniences (Greenebaum, 2012; Minson & Monin, 2012; Romo & Donovan-Kicken, 2016). For the development of strategies for a transition to a less meat-based diet, therefore, it is important to carefully consider the mindset and motivation of vegetarian and meat-eating consumers. This comparison should use insights on the identity concept from cognitive social psychology (Oyserman, 2009; 2014) and cognitive sociology (Brekhus, 1998; 2008), and take due account of the differences between low, medium and high meat-eaters, which are often neglected. It is also worthwhile to include a broader, multicultural perspective in the comparison because

immigrants are a growing part of the population in Western countries and ethnicity is one of the main factors that play a role in food choices (Gilbert & Khokhar, 2008; Ruby, Heine, Kamble, Cheng, & Waddar, 2013; Schösler, de Boer, Boersema, & Aiking, 2015). From this strategic perspective, the present paper provides a comparison of (self-declared) vegetarians, low, medium and high meat-eaters, based on two samples of young adults (aged 18-35) in the Netherlands ( $n = 357$  and  $n = 350$ ), of which the second one has a multicultural (Chinese Dutch) background.

### Identity concept

A crucial aspect of our approach is the identity concept; it has high relevance in relation to the motivation and behavior of both vegetarians and meat eaters, helps to bring out the special asymmetry between vegetarian and non-vegetarian identities, and provides a brief introduction to the research questions. An identity is an organizing principle in an individual's life, which provides a feeling of continuity but also involves many social and personal aspects that differ in importance or influence on behavior and that make an identity highly sensitive to situational cues (Oyserman, 2009). In our case, the terms 'vegetarians' and 'non-vegetarians' are used as labels of identity categories that may become relevant in the context of food-related situations (e.g. in the shop or at the table). This labeling leaves much room for individuals to personalize these categories and it should be noted that people, in describing the type of eater they are, often refer to the range of foods that are acceptable for them to eat (Bisogni, Connors, Devine, & Sobal, 2002). There are finer distinctions, for instance, between vegetarians (avoiding meat, poultry and fish) and vegans (additionally avoiding dairy and eggs), or between ethically

oriented and health oriented vegetarians (Beardsworth & Keil, 1992; Hoffman, Stallings, Bessinger, & Brooks, 2013; Rozin, Markwith, & Stroess, 1997; Ruby, 2012), or Western-style and Eastern-style vegetarians (Ruby et al., 2013). For the strategic purposes of the present study, the broad categories (vegetarians and non-vegetarians) are often sufficient, but more detailed categories are reported when relevant.

The link between identity and behavior depends on (explicit or implicit) beliefs about ‘people like me,’ which influence whether or not a particular behavior (e.g. avoiding meat) feels congruent with important aspects of one’s identity in that context (e.g. being a vegetarian), and such identity-congruence, in turn, influences mindset and resulting behavior (Oyserman, 2009). The resulting behavior may seem to resemble a habit, because a choice that has become identity-linked feels right and does not require further reflection, unless it is disturbed (Bisogni et al., 2002; Fischler, 1988; Oyserman, 2009). With regard to behavior change, identity-based motivation has particular relevance to understanding how individuals who are trying to change their behavior cope with difficulties that require action and effort. They can be either motivated or demotivated to overcome the difficulties, depending on whether the change feels identity-congruent (‘for people like me’) or identity-incongruent (‘not for people like me’) (Oyserman, 2014). For example, individuals who make the choice to eat plant protein instead of animal protein may interpret difficulties (cooking new recipes) in motivating ways if this choice feels identity-congruent. Indeed, the role of a socially based and personalized identity in the successful adoption of a vegetarian diet has been described in several qualitative studies of the process of joining (Cherry, 2015; Jabs, Devine, & Sobal, 1998), maintaining or

leaving vegetarianism (Barr & Chapman, 2002; Haverstock & Forgays, 2012; Menzies & Sheeshka, 2012). In view of the efforts made by vegetarians to manage vegetarianism (Greenebaum, 2012; Jabs, Sobal, & Devine, 2000), it may be important to examine their food-related motivation and enjoyment of food in ways that can be compared to non-vegetarians (e.g. see Schösler, de Boer, & Boersema, 2014).

#### Asymmetry between vegetarian and non-vegetarian identities

A key aspect of comparing vegetarians and non-vegetarians is the highly asymmetrical relationship between these identity categories (see Brekhus, 2008). Being a vegetarian is an identity category that is socially marked and evaluated as distinct from conventional behavior, whereas being a non-vegetarian is unmarked and socially taken for granted. Generally, in this type of social contrast, the marked category can be valued either highly positively (by in-group members) or negatively (by others). The asymmetry has significant consequences for the influence of identity-based motivation on mindset and behavior. A salient issue in this context is that the sheer quantity of meat consumption is not decisive for how consumers see themselves. Some studies show that self-declared vegetarians may still report meat or fish consumption on a food frequency questionnaire, which could lead to misclassifications in epidemiological studies (Gilsing et al., 2013; Vinnari, Montonen, Härkänen, & Männistö, 2009). Whether vegetarians who occasionally eat meat may have feelings of incongruence will depend on the diet rules they set for themselves and for others, which can be more strict or more flexible (Hoffman et al., 2013; Jabs et al., 2000). For instance, it has been shown that such flexible vegetarians might be considered ‘vegetarian impostors’ (as opposed to authentic

vegetarians), especially by other vegetarians (Hornsey & Jetten, 2003). Impacts of identity-based motivation may become particularly apparent when individuals claim to be a vegetarian with ethical views on the animal origin of meat (Greenebaum, 2012; Hoffman et al., 2013; Rozin et al., 1997), such as the cruelty of meat production and the denial of the right of humans to kill animals for food (Lea & Worsley, 2004). Therefore, apart from the meat eating frequency, it is important to know the underlying reasons why vegetarians feel they have to abstain from meat.

As being a non-vegetarian is socially unmarked and largely taken for granted, the role of identity-based motivation may be less salient for non-vegetarians. In countries where meat is widely available and also relatively cheap, frequent meat eating may become a conventional meal pattern that is intricately linked to one's identity as a consumer, which feels right and does not require further reflection (e.g. Graça, Calheiros, & Oliveira, 2015; Lea, Crawford, & Worsley, 2006; Macdiarmid, Douglas, & Campbell, 2016; Pohjolainen, Vinnari, & Jokinen, 2015; Schösler et al., 2014; Vanhonacker, Van Loo, Gellynck, & Verbeke, 2013). For non-vegetarians the influence of identity-based motivation may become salient in situations where they meet vegetarians (Rothgerber, 2014) or miss the meat (Ensaaff et al., 2015; Lea, Crawford, & Worsley, 2006). Then they may realize that vegetarianism is the opposite of meat-eating and that they themselves are not vegetarians. This may have a significant impact on their mindset and motivation, especially in combination with other aspects of their identity. For instance, traditional framings of masculinity, emphasizing that 'real men' eat meat (Rozin, Hormes, Faith, & Wansink, 2012; Schösler et al., 2015; Sobal, 2005), may give the impression that a



vegetarian option is unmanly, which can make it a less appealing choice for men (Nath, 2011; Ruby & Heine, 2011).

Differences among non-vegetarians in meat consumption level and red meat appreciation have only recently drawn attention from researchers as being relevant to the study of diet and lifestyle choices (Bourdieu, 1984; de Bakker & Dagevos, 2012; de Boer, Hoogland, & Boersema, 2007; Sobal, 2005; Verbeke & Vackier, 2004). Frequent meat eaters may be distinguished from those at the lower end of the meat consumption spectrum, such as 1 day/week meat consumers, who do not claim to be vegetarians, however (Baker, Thompson, & Palmer-Barnes, 2002; Gilsing et al., 2013). The same applies to non-vegetarians with a relatively low appreciation for red meat (from mammals), who may prefer white meat (from poultry) for taste-related reasons, such as pickiness about fat and bones (de Boer & Aiking, 2011; Kubberød, Ueland, Rødbotten, Westad, & Risvik, 2002). Hence, despite the fact that they are all non-vegetarians, they may have different reasons for frequently eating meat or not frequently eating meat.

#### Strategically relevant comparisons

Although the literature shows that there are many ways in which non-vegetarians differ from vegetarians (see for a detailed overview Ruby, 2012), not all the differences are equally relevant for the development of a transition to a reduced meat diet. For instance, Western-style vegetarianism is often associated with non-conformist lifestyles and certain youth subcultures, such as Punk (Cherry, 2015), which are very context-dependent. As the percentage of vegetarians in the population tends to be low, studies in this field are

often based on very small numbers of cases, making the results difficult to generalize. Another important issue is that it may be relevant for a transition to compare vegetarians with well-chosen categories of non-vegetarians and to identify not only differences but also similarities. The topic of similarities has not received much attention yet. In an early Australian study, which oversampled the number of vegetarians, Lea and Worsley (2004) concluded that a significant minority of the non-vegetarian population had similar beliefs about red meat and vegetarian diets as vegetarians and were less likely than the remaining non-vegetarians to eat red meat. A population-based study in the Netherlands, which did not oversample the number of vegetarians, observed that non-vegetarians mentioned several reasons to moderate their meat eating frequency, which broadly correspond with the reasons vegetarians might have to abstain from meat, including health and animal welfare (Schösler et al., 2014). However, no studies until now have sufficient data for a complete comparison of strategically relevant categories of meat eaters, which are, according to experts (Scarborough et al., 2014), low (less than 50 g/d), medium (50 to 99 g/d) and high meat-eating (100 g/d and more).

The present study allows for a comparison between young vegetarians, low, medium, and high meat-eaters. In its design, no special attempts were undertaken to oversample the number of vegetarians. To obtain insights into the generalizability of the results, a side by side comparison of datasets from multiple samples was used. This approach can add a multicultural dimension to the findings observed in a single-country study, which may be very helpful to get a better insight into the context-dependency of social and psychological phenomena and their variation across human populations (see Henrich,

Heine, & Norenzayan, 2010). In our case, the study was part of a broader project aimed to clarify how young adults in the Netherlands may contribute to promoting healthier and sustainable food choices, taking due account of the multiethnic character of future populations. To represent the multicultural dimension, we focused on the second generation of migrants, defined as young Dutch adults from whom at least one of the parents was born abroad. Two important new ethnic groups were chosen, namely the Chinese Dutch (hereafter called Chinese) and the Turkish Dutch (hereafter called Turkish) migrants. For reasons of clarity, the other Dutch adults are hereafter called native Dutch.

The research questions are: How do the vegetarians and the three categories of meat eaters differ in relation to 1) key characteristics of their hot meal, 2) strength and profile of their food-related motivation, and 3) reasons for and reasons against frequently eating meat? The characteristics of hot meals (number per day, consumption of meat, fish, meat substitutes) were asked for descriptive purposes. It should be noted that the Dutch cuisine is relatively simple, but that there are various possibilities to prepare meals without animal-based products, for example, by using meat substitutes. The Chinese and Turkish cuisine also include foods that may be considered meat substitutes due to their protein content, although they may also be used alongside meat. This applies, for instance, to tofu, which is a popular food in Chinese cooking, and the various kinds of pulses that are a regular part of Turkish cooking. However, a difference is that China has a long tradition of Buddhist vegetarianism (Kieschnick, 2005). Although Turkish cooking is by tradition low on meat (Bilgic & Yen, 2014), vegetarianism might be considered problematic; in a

study among university students in Ankara (Turkey) vegetarianism was specifically associated with disordered eating attitudes and behaviors (Baş, Karabudak, & Kiziltan, 2005). As none of the Turkish participants in our survey declared to be a vegetarian (which will be revisited in our discussion below), the present analysis focuses on the Dutch natives and the Chinese migrants.

The second and third research question build on earlier work. Food-related motivation was assessed by a scale developed by Schösler et al (2014), which was inspired by Self-Determination Theory (SDT; e.g. see Deci & Ryan, 2000; Kasser, 2002). The scale puts an individual's choices about food into the perspective of intrinsic, self-determined (versus extrinsic, non-self-determined) motivation, defined as enjoyment of food by deriving pleasure and satisfaction from preparing one's own food, taking time to eat it and to experience its taste (Schösler et al., 2014). As the scale items refer to slightly different aspects of food-related practices, both the strength and the profile of this motivation were considered important. The reasons for and the reasons against frequently eating meat were also derived from Schösler et al (2014). Although self-reported reasons for choices must be interpreted with caution, they can reveal significant differences in context specific motivation, because they help individuals justify and defend their actions, especially if both 'reasons for' and 'reasons against' performing a behavior are considered (Claudy, Garcia, & O'Driscoll, 2015; Westaby, 2005).

## Method

### Participants and procedure

Data were gathered in face-to-face interviews with participants (aged 18–35) in different parts of the Netherlands. The survey was organized in two (of the four) large-sized cities and two medium-sized cities with relatively high numbers of second generation migrants. In each city, quota sampling was applied with quota on ethnic background (native Dutch, Chinese or Hong Kongese, Turkish or Kurdish), gender, age groups, and level of education. A team of professional interviewers from Motivaction research agency recruited the participants in various ways and by interviewing both on weekdays and in weekends, during the day and in the evening. Participants either had to be born in the Netherlands or to have moved here before their 8th birthday. They were recruited in various neighborhoods, where they were addressed in the street or contacted at home or through clubs, societies and eating places. They were rewarded with a calling card with a value of € 7.50 for a 30-minutes interview about two different topics (i.e. outdoor recreation and food), which could take place at home or at another convenient location. All interviews were conducted in Dutch, using a questionnaire on a laptop, but the interviewers of the migrants were all native speakers of the participant's mother tongue. The fieldwork, carried out in May and June 2013, resulted in the completion of 357 interviews with natives, 350 with Chinese and 350 with Turkish migrants. As mentioned above, none of the latter declared to be a vegetarian, which makes the data from this group unsuitable for the present analysis. Table 1 shows the main characteristics of the other two samples. Compared to the natives, the Chinese were slightly younger and had a

slightly higher education level. In both samples, 43% of the participants were still studying.

## TABLE 1

### Measures

The questionnaire comprised modules with structured questions about various topics, including questions about outdoor recreational behavior, which were developed in a co-operating study. Other modules dealt with food activities, food consumption (in particular meat) and descriptive variables (e.g. age, level of education, country of birth). The questionnaire had been tested in 10 pilot interviews, after which it was adjusted by altering its length. The results regarding ethnic differences in outdoor recreational behavior (Kloek, Buijs, Boersema, & Schouten, 2015), and ethnic-by-gender differences in food-related beliefs and behaviors (Schösler et al., 2015) were described in separate papers. Here the focus is on the comparison between vegetarians and the three strategically relevant categories of meat eaters.

### Dietary groups

The participants were categorized in four dietary groups, representing (self-declared) vegetarians, low, medium and high meat-eaters. The categorization of the meat eaters required information on the frequency of their meat consumption and the portion size. Because meat consumption in the Netherlands is largely associated with the main meal of the day, a single question was used to identify vegetarians and to measure the number of

meat eating days (per week) of the others. The question “How many days per week do you eat meat with your main meal (including chicken)?” had a special answer category for recording “none, because I am a vegetarian”. As a proxy to estimate the average intake of meat per day, the number of meat eating days was combined with the preferred meat portion size. The participants were asked to indicate what portion size of a piece of meat they would be most inclined to choose. The alternatives were 50, 100, 150 or 200 grams. These numbers should not be taken too literally but only as a ground for categorization. The product of the answers to the two questions, divided by 7, was the basis for the categorization into low (less than 50 g/d), medium (50 to 99 g/d) and high meat-eaters (100 g/d and more).

#### Characteristics of the hot meals

A set of questions was used to assess some key characteristics of the participants' hot meals. They were asked about the number of hot meals per day (answer categories: 0, 1, 2 and 3) and about which types of meat they ate (i.e. poultry, beef, pork, and lamb or sheep). In addition, they were queried about the consumption of fish and meat substitutes. The latter are products that are specially made to replace meat on the plate, such as Tofu, Quorn®, Tivall® steak, and spinach rondos. Therefore, it was first probed whether the participant was familiar with these meat substitutes and then whether they used them. By way of characterizing their diet, all participants were asked whether they thought of their meals as typically Dutch; the migrants were also asked whether they thought of their meals as typically Chinese.

### Food-related motivation

The participants were asked to respond to a small set of statements that may reveal their food-related motivation and perception of the food environment (not reported in the present paper). Due to time limitations, the set was limited to 10 of the 22 items developed by Schösler et al. (2014). The focus here is on four statements about deriving pleasure and satisfaction from preparing one's own food, taking time to eat it and to experience its taste, which belonged to an intrinsic motivation scale. Examples of the statements include: "I feel happy when I have time and attention to cook" (for all items, see Table 4). The answers to the items on a Likert-type scale varied from 1 (*completely disagree*) to 7 (*completely agree*). The statements refer to slightly different aspects of food-related practices (i.e. cooking, tasting, ensuring its purity, and dealing with food providers), which makes it meaningful to analyze not only the overall strength of the agreement with the statements but also the profiles of item scores across the dietary groups.

### Reasons for and reasons against frequently eating meat

The non-vegetarians were asked to report a maximum of three reasons for frequently eating meat. Based on earlier work (Schösler et al., 2014), the 9 answer categories included taste ("Being a meat lover"), health ("It's healthier"), habit ("It is what I am used to"), appropriateness ("It fits well with what I normally eat"), and household context ("Others in the household want to eat meat") (for all items, see Table 5). In addition, both vegetarians and non-vegetarians were asked to indicate a maximum of three reasons for *not* frequently eating meat. Again, the 9 answer categories included taste, health, habit,



and household context, but also financial concerns and ethical issues (“Because I think animal welfare is important”, “Because it’s better for the environment”) (for all items, see Table 6).

### Analysis

For each research question, descriptive statistics were presented in percentages and means, separately among the natives and the migrants. Differences between the vegetarians, low, medium and high meat-eaters were tested using Chi square with Cramer's  $V$  as measure of effect size and one-way ANOVA with eta squared ( $\eta^2$ ) to estimate effect size.

For research question 2 (how do the dietary groups differ in relation to the strength and profile of their food-related motivation) the four-item scale about deriving pleasure and satisfaction from preparing one’s own food, taking time to eat it and to experience its taste was first analyzed as a whole to calculate Cronbach’s *alpha* and then in its discrete parts to test whether the profiles of item scores across the dietary groups were parallel to one another, using profile analysis (i.e. the repeated measures extension of MANOVA, see Tabachnick & Fidell, 2007). Profile analysis was conducted with the levels of agreement with the four statements as dependent measures and two between-subjects factors (ethnic background and dietary group). The analysis determined whether the levels of agreement differed across the statements (within-subjects factor) and whether subgroups of participants differed in levels of agreement across the statements (profile magnitude) and in the shape of the profile of the levels of agreement (profile shape). The

interpretation of significant results was supported by profile plots (not shown in the paper) and pairwise post hoc comparisons, with Bonferroni correction for multiple comparisons. Huynh-Feldt corrections were used when assumptions of sphericity were violated. To control for the gender differences in the dietary groups, gender was used as a covariate.

Research question 3 (how do the dietary groups differ in relation to reasons for and reasons against frequently eating), was addressed by univariate analyses (one-way ANOVA), complemented by a multinomial logistic regression to explore the multivariate relationship between the reasons for *not* frequently eating meat and the dietary groups, also with gender as a covariate. A similar analysis was performed regarding the relation between the reasons for frequently eating meat and the groups of low, medium or high meat-eaters. Finally, a multinomial logistic regression was performed to identify the reasons for or against frequent meat eating that were the most predictive of dietary group. All tests were two-tailed ( $p < .05$ ). The analyses were conducted with SPSS 23 for Windows.

## Results

### Dietary groups

The categorization of the participants in four dietary groups, representing self-declared vegetarians, low, medium and high meat-eaters, was based on their answers to the questions on the frequency of meat consumption and the preferred portion size. Table 2 shows the sizes of the four groups and their characteristics in terms of frequency of meat consumption and preferred portion size. The number of vegetarians was low: 24 (7%) of the natives and 19 (5%) of the Chinese. In the three meat eating groups, the frequency of meat consumption was about 2-3 days per week in the low group, about 4-5 days in the medium group and about 6 days in the high group. In each of the meat eating groups, the Chinese reported a somewhat higher number of meat eating days than the native Dutch. Table 2 also shows some descriptive characteristics of the four dietary groups. In both samples, the vegetarians were more often women (about 70%), whereas the high meat-eaters were more often men (about 70%). Therefore, it was decided to use gender as a covariate in further analyses. Additionally, there were some small differences in age and level of education. The low meat-eating natives were more likely to be still studying and the vegetarian Chinese were relatively young.

### TABLE 2

#### Characteristics of the hot meals

Some other characteristics of the meals eaten by the four groups are presented in Table 3. It shows that about 90% of the natives and about 80% of the Chinese had one hot meal

per day (typical of the Dutch culture, but perhaps unusual for Chinese), without much difference between the dietary groups. Table 3 also reveals that the vegetarian natives were not all very strict, as some of them reported to occasionally eat meat (12% of the vegetarian natives and 0% of the vegetarian Chinese). Most of the vegetarian natives and most of the low and medium meat-eaters reported to eat fish. However, the consumption of meat substitutes was not very popular among the natives, including the vegetarians (25%) and the low meat-eaters (21%). In contrast, the vegetarian Chinese mainly reported to eat meat substitutes (79%). Table 3 also shows that, apart from the vegetarians, the percentages who reported eating beef or pork (red meat) increased in both samples from moderate levels (about 40%-50%) in the low meat-eating groups to high levels (about 80%-90%) in the high meat-eating groups. Poultry (white meat) was the most popular type of meat among the low and the medium meat-eaters. In response to the question whether they thought of their meals as typically Dutch, about half of the natives answered affirmatively, including a large percentage of the vegetarian (62%) and low meat-eating natives (57%). Most of the Chinese did not think of their meals as typically Dutch (11%), but neither did they think of their meals as typically Chinese (37%).

### TABLE 3

#### Strength and profile of food-related motivation

The four statements about deriving pleasure and satisfaction from (1) ensuring the purity of one's food, (2) having a personal connection with food providers, (3) tasting, and (4) cooking, which are presented in Table 4 in order of decreasing agreement among the

vegetarian natives, were meant to assess the relative strength and the profile of the participants' intrinsic motivation. The responses to the statements correlated consistently with each other (Cronbach's  $\alpha$  was .69 (natives) and .80 (Chinese)). Multivariate analysis showed that the responses of the vegetarians had a distinct profile, mainly due to their relatively high level of agreement with one of the statements ("I prefer to prepare food myself because I want to eat everything as pure as possible"). More technically, the 2 x 4 (Ethnic Background [natives, Chinese] x Dietary Group [vegetarians, low, medium, high meat-eaters]) MANOVA (with Huynh-Feldt correction to correct for non-sphericity) revealed that the participants responded differently to the four statements ( $F(2.80, 1920.41) = 6.56, p < .001, \eta_p^2 = .008$ ), indicating that the mean levels of agreement can meaningfully be ranked from high to low. The covariate gender had a significant effect on both the mean level of agreement with the four statements ( $F(1, 698) = 40.26, p < .001, \eta_p^2 = .055$ ) and the shape of the profile of the agreement levels ( $F(2.80, 1920.41) = 3.08, p < .05, \eta_p^2 = .004$ ), with women scoring higher than men, but less so regarding the personal connection with food providers. The two between-subjects factors, ethnic background ( $F(1, 698) = 0.70, p > .05$ ) and dietary group ( $F(3, 698) = 0.60, p > .05$ ) had no significant effect on the mean level of agreement with the four statements, but did affect the shape of the profile of the agreement levels. That is, the Statements x Ethnic Background interaction ( $F(2.80, 1920.41) = 6.37, p < .001, \eta_p^2 = .009$ ) and the Statements x Dietary Group interaction ( $F(8.38, 1920,41) = 2.51, p < .01, \eta_p^2 = .011$ ) were significant. Regarding ethnic background, the mean levels of agreement showed that the Chinese agreed more often than the natives with the statement on the experience of tasting (see Table 4). Regarding the dietary groups, the post hoc comparisons (with

Bonferroni correction) in each sample separately, revealed that the responses of the vegetarians had a distinct profile. As mentioned above, the vegetarians agreed more often with the statement on purity ( $M = 4.96$  (natives),  $M = 4.68$  (Chinese)) than, in particular, the high meat-eaters ( $M = 3.87$  (natives),  $M = 4.05$  (Chinese)), with the low meat-eaters in between (see Table 4). Although the differences were slightly smaller among the Chinese, there was no significant Statements x Ethnic Background x Dietary Group interaction ( $F(8.38, 1920,41) = 1.50, p > .05$ ).

#### TABLE 4

##### Reasons for not frequently eating meat

The differences between the dietary groups were also reflected by their reasons for *not* frequently eating meat, which are presented in Table 5 in order of decreasing agreement among the vegetarian natives. The vegetarians reported two key reasons, namely “I don’t like meat very much” (71% (natives), 47% (Chinese)) and “I think animal welfare is important” (71% (natives), 68% (Chinese)). These reasons were mentioned much less often by the low, medium and high meat-eaters. In contrast, unlike the vegetarians, about 30%-40% of the non-vegetarians referred to financial reasons for *not* frequently eating meat. An important characteristic of the high meat-eaters was that they rejected most of the reasons. In this dietary group, 64% (natives) and 79% (Chinese) mentioned only one reason, whereas the others mentioned more than one (see Table 5). Among the natives, both the vegetarians and the low and medium meat-eaters mentioned several reasons relatively often (about 30%-40%), including “I like to vary”, “It’s healthier” and “it is

better for the environment”, but these reasons were not specific for a particular dietary group. Among the Chinese, these percentages were somewhat lower, except for the financial reasons. These observations were supported by the results of the multinomial logistic regression, used to further analyze the relationship between the reasons for *not* frequently eating meat and the dietary groups. Among the natives, the overall model resulted in a Nagelkerke pseudo  $R^2$  of .44 ( $\chi^2=186.77$ ,  $df=27$ ,  $p < .001$ ). Adding gender increased  $R^2$  significantly ( $R^2 = .50$ ,  $\chi^2=217.37$ ,  $df=30$ ,  $p < .001$ ); by comparison, the model with gender as single predictor led to  $R^2 = .10$  ( $\chi^2=32.63$ ,  $df=3$ ,  $p < .001$ ). The final model predicted the four dietary groups about equally well (50% to 59% correct); the two key reasons (not liking meat and animal welfare) significantly predicted the vegetarians, but the other reasons were not specific for a particular dietary group. Among the Chinese, the results were slightly different, because the overall model was less accurate in its prediction of the four dietary groups; the vegetarians and the low meat-eaters were predicted less well (26% and 11% correct) than the medium and high meat-eaters (53% and 85%). The overall model resulted in  $R^2 = .34$  ( $\chi^2=127.07$ ,  $df=27$ ,  $p < .001$ ); adding gender led to  $R^2 = .43$  ( $\chi^2=170.22$ ,  $df=30$ ,  $p < .001$ ); the model with gender as single predictor led to  $R^2 = .13$  ( $\chi^2=42.61$ ,  $df=3$ ,  $p < .001$ ). Again, the overall model showed that the two key reasons significantly predicted the vegetarians and that the other reasons were less distinctive.

#### TABLE 5

Reasons for frequently eating meat

The differences between the low, medium and high meat-eaters were further analyzed based on the reasons they mentioned for frequently eating meat, which are presented in Table 6 in order of decreasing agreement among the low meat-eating natives. The reason this group mentioned the most often was that it is healthier to eat meat frequently (53%). The health reason was reported by a significantly lower percentage of the high meat-eaters (26%). In contrast, the latter more often stated to be a meat lover (67%), which was mentioned significantly less often but still frequently by the low meat-eating natives (45%). Habit (“It is what I am used to”) and appropriateness (“It fits well with what I normally eat”) were also mentioned quite often, but these were not distinctive for a particular group. Small but distinctive percentages of the low meat-eaters referred to meat eating as a sign of welfare or something for a special occasion. Among the low meat-eating Chinese, habit (57%) and appropriateness (40%) were mentioned relatively often and, to a lesser extent, taste (36%), but not health (11%). Being a meat lover was reported by 57% of the high meat-eating Chinese, who often mentioned only one reason (41%).

Among the natives, the overall model led to  $R^2 = .20$  ( $\chi^2 = 64.74$ ,  $df = 18$ ,  $p < .001$ ); adding gender resulted in  $R^2 = .27$  ( $\chi^2 = 88.72$ ,  $df = 20$ ,  $p < .001$ ). The final model predicted the low meat-eaters (42% correct) and the high meat eaters (54% correct) less well than the medium meat-eaters (66% correct). Among the Chinese, the overall model led to  $R^2 = .17$  ( $\chi^2 = 53.33$ ,  $df = 18$ ,  $p < .001$ ); adding gender resulted in  $R^2 = .27$  ( $\chi^2 = 87.83$ ,  $df = 20$ ,  $p < .001$ ). The final model predicted the low meat-eaters (19% correct) and the medium meat-eaters (57% correct) less well than the high meat-eaters (74% correct).



TABLE 6

Reasons that are the most predictive of the meat eating groups

To identify the reasons for or against frequent meat eating that are the most predictive of the meat eating groups, a multinomial logistic regression was performed using a stepwise forward method (without gender). Among the natives, the reduced model ( $R^2 = .32$ ,  $\chi^2 = 108.87$ ,  $df = 14$ ,  $p < .001$ ) predicted the low (51% correct), medium (54% correct) and high meat-eaters (59% correct), based on the 7 reasons that are marked by a dagger in Tables 5 and 6. In this way, the tables present information on the popularity and distinctiveness of the reasons. Among the Chinese, the reduced model ( $R^2 = .22$ ,  $\chi^2 = 70.76$ ,  $df = 12$ ,  $p < .001$ ) predicted the low (19% correct), medium (64% correct) and high meat-eaters (66% correct), based on the 6 reasons that are marked by a dagger in Tables 5 and 6. Despite some differences between the samples, the common result is that liking to vary one's meal, taste (liking or not liking meat), habit, household context (what others want to eat) and health reasons are significant predictors of the low, medium and high meat-eaters. Among the natives, the speciality of the occasion and animal welfare are also significant predictors; among the Chinese this applies to environmental concerns. Focussing on the role of health reasons, some additional analyses have been done to investigate the answers that promote or limit frequent meat eating. Of the low meat-eating natives ( $n = 118$ ), 71% referred to health; 18% as a reason for not frequently eating meat, 33% as a reason for frequently eating meat, and 20% as a reason for both. This pattern was less pronounced among the other dietary groups, including the Chinese.

## Discussion

This study was meant to provide insight into differences and similarities in the mindset and motivation of young vegetarians, low, medium, and high meat-eaters to support the development of strategies for a general transition to a less meat-based diet. The results underline the importance of identity as an organizing principle and the differences between identity categories that are socially marked and those that are socially taken for granted. The analysis indicated that the vegetarians had the same level of food-related motivation as the other dietary groups, but that they had a different motivational profile; they wished to prepare their own meals as they wanted to eat everything as pure as possible. This agrees with the notion that vegetarians have to manage vegetarianism, partly because they feel that others do not fully understand what they need (Greenebaum, 2012; Jabs et al., 2000). The reported reasons for and against frequent meat eating revealed significant differences in context-specific motivation. Not all of the vegetarians adhered equally strict to vegetarianism, but most of them mentioned distinctive, taste- and animal-welfare related reasons to justify their abstinence from eating meat. In contrast, most of the high meat-eaters were probably inclined to take their meat choices for granted, as they rejected many of the potential reasons against frequent meat eating, but also seemed to have few pronounced reasons for frequent meat eating. This agrees with several studies that have been done to find out how non-vegetarians tend to justify their meat consumption, which show that they typically see it as 'normal' and do not give it much thought (Bastian & Loughnan, 2016; Bohm, Lindblom, Åbacka, Bengs, & Hörnell, 2015; Piazza et al., 2015). The low and medium meat-eaters generally took positions in between the other two dietary groups. They were not only low in amounts of

meat consumption but also more avoidant of the red types of meat, and they showed similar motives for their choices, in particular health reasons and a preference to vary one's meal. More generally, the participants' references to habit and household context underline that meat eating is often based on decision rules that are applied over and over again rather than being reconsidered on every occasion. Yet, the underlying differences in motivation are very relevant for transition strategy development.

A crucial strategic issue is that the importance of animal welfare for the vegetarians was shared by only small percentages of the low and medium meat-eaters as a reason for not frequently eating meat. Similar differences between vegetarians and ethical 'conscious omnivores' have been described by Rothgerber (2015). In part, such small percentages may be explained by the fact that many modern consumers are accustomed to highly standardized meat products, commonly sold in supermarkets and de-animalized to avoid reminding customers about the link between the meat dish and the killing of an animal (Hoogland, de Boer, & Boersema, 2005; Schröder & McEachern, 2004; Tian, Hilton, & Becker, 2016; Vialles, 1994). Another explanation is that consumers develop distinct categories for food animals and other animals, which are associated with different beliefs about the capacity of the animals to suffer (Bratanova, Loughnan, & Bastian, 2011). Building on the idea that there is currently a paradox between people's love for animals and their love for eating them, many studies have explored whether and under what conditions non-vegetarians may feel some incongruence in regard to meat eating (Bastian & Loughnan, 2016; Bratanova et al., 2011; Hoogland et al., 2005; Kunst & Hohle, 2016; Loughnan, Haslam, & Bastian, 2010; Rothgerber, 2014; Tian et al., 2016). Results of

several experiments show that consumers are sensitive to traditional reminders of the animal origin of meat, such as a carcass with a head, which may give rise to feelings of empathy for the animal that had been slaughtered or negative feelings about eating the meat (Hoogland et al., 2005; Kunst & Hohle, 2016; Tian et al., 2016). What the experiments also demonstrate is that some of these consumers then become sensitive to an opportunity to act ethically, for instance, by favoring free range and organic meat (Hoogland et al., 2005) or by choosing a vegetarian alternative (Kunst & Hohle, 2016), if this option is offered to them. Whether this effect is lasting and robust against habituation effects is not yet known, however.

From a strategic perspective, it is very interesting that health reasons and preferences to vary one's meal were associated with low and medium meat-eating. Health reasons were mentioned in terms of both reasons for and reasons against frequent meat eating, which might be interpreted as a choice for eating meat without overdoing it. This means that health, variety and moderation may be important themes for campaigns to be mindful of meat. One of the strategic advantages of a health-focused campaign is that it is more neutral than an ethical-focused one; the latter may give meat eaters the impression that their whole identity is being judged by vegetarians who see themselves as morally superior to non-vegetarians. As some experiments have demonstrated, this impression can result in 'do-gooder derogation', the putting down of morally motivated others (Minson & Monin, 2012), and a reduced commitment to ethical values (Zane, Irwin, & Reczek, 2016). In view of this, campaigners for meat moderation may learn lessons from the literature on the way in which vegetarians discuss their diet and lifestyle to meat

eaters (Greenebaum, 2012; Romo & Donovan-Kicken, 2016). Greenebaum (2012) notes that the vegetarians and vegans in her study engaged in ‘face-saving’ techniques when they wanted to explain their cause to omnivores and tried to manage the tension of the interaction. The techniques include avoiding confrontation, waiting for an appropriate time, focusing on health benefits, and leading by example, emphasizing the ease and joy in eating a vegetarian or vegan meal. In other words, it may be advisable for campaigns for meat moderation to put the focus of attention on the meat-free food itself and not on vegetarianism as an identity category.

Another strategic issue is the role that environmental and financial reasons could play in campaigns for meat moderation. One of the underlying problems is that meat can be cheap in many countries, because the environmental impacts of meat production are not included in the market price (Säll & Gren, 2015). As a result, there is no financial signal that can make the environmental impacts more concrete. In our study, environmental and financial reasons were mentioned relatively often, but the fact that they were also mentioned by high meat-eaters indicates that, under the current circumstances, these reasons are not decisive for a reduction in meat consumption. This agrees with the findings of other studies; in surveys in several countries, including Australia (Lea & Worsley, 2008), Finland (Latvala et al., 2012), Flemish Belgium (Vanhonacker et al., 2013), the Netherlands and the United States (de Boer, de Witt, & Aiking, 2016), Portugal (Graça et al., 2015), Sweden (Hunter & Rööös, 2016) and Switzerland (Tobler, Visschers, & Siegrist, 2011), significant minorities of consumers acknowledged the environmental impacts of meat eating, but the overall picture is that they had developed

an abstract awareness of these impacts, without strong and decisive reasons to reduce their consumption. A multi-country study on consumer perception of options to mitigate climate change showed that the outstanding effectiveness of the ‘eating less meat’ option was recognized by merely 6 to 12% of the consumers (de Boer et al., 2016). In order to stimulate a broad transition, therefore, there is an urgent need to involve much larger segments of consumers and to go from largely abstract to very concrete, which may require multiple signals, including financial ones.

The multicultural dimension of the study design was crucial for our understanding of the generalizability of the findings. The comparison was also very helpful to get a better insight into some cultural phenomena that may be typical for the natives or the migrants in the Netherlands, although a discussion of the latter’s acculturation experiences would go beyond the scope of this paper. A salient issue was the lack of vegetarians in the Turkish sample, which suggests that there are cultural influences on the viability of this identity category. Another salient issue was the apparently low appreciation of meat substitutes by the vegetarian natives in comparison with the vegetarian Chinese. The low appreciation may be attributed to properties of the products themselves but also to specific combinations of the products and the meals in which they are used (Elzerman, Hoek, van Boekel, & Luning, 2011). Both may apply to the Chinese, because, for instance, Tofu has been a popular food in Chinese cooking for ages. In this respect, it must be noted that the meals of the natives and the Chinese are based on different food philosophies, which have been adapted to the prevailing socioeconomic conditions. For instance, meats were traditionally used as flavorings or condiments in Eastern countries

(Nam, Jo, & Lee, 2010). Due to their fast economic growth and urbanization, however, the level of meat production and consumption in Eastern countries has grown rapidly, which is leading to what has been characterized as an unhealthy Western type of diet, often based on traditional recipes with major additions and changes (Zhai et al., 2014). Indeed, our data indicate that the young migrants were relatively high in meat consumption (pork and poultry). A related issue is how consumers view the relationship between food and health. The natives often considered health a reason to eat meat as well as to moderate meat eating, which reflects Western nutritional categorizations; health was also mentioned by the low and medium meat-eating Chinese as a reason to moderate but they may have had other views on the relationship between food and health.

Although many studies have been done to examine whether and under what conditions non-vegetarians may feel some incongruence in regard to meat eating (see above), a largely under-researched question is whether eating plant-based proteins can feel identity congruent for non-vegetarians. Some studies report that the association of plant-based proteins with vegetarianism was met with disapproval by meat eaters (Ensaiff et al., 2015; Lea et al., 2006). There are several ways in which these identity-related problems might be addressed. As healthy eating recommendations may be perceived by ‘masculine’ men as ‘feminine’ ways of eating, it might be wise to give plant-based foods a ‘masculine makeover’ (Mróz, Chapman, Oliffe, & Bottorff, 2011). Alternatively, it has been shown that ethnically-inspired, savory meat-free meals, such as Indian daal, may be attractive for consumers with an adventurous taste (Schösler, de Boer, & Boersema, 2012). A promising strategy may be to present meat substitutes within their food-cultural context;

Tofu may be marketed as a product that fits well in Asian stir fries and chick peas or lentils can be marketed as a component of Turkish or Moroccan meals, such as couscous. It may also be advisable to modernize the image of existing protein products, such as food pulses (Schneider, 2002). In addition to emphasizing the nutritional and health benefits of food pulses, it may be important to create savory dishes with modern, convenient and varied, healthy products, such as lentils, which seem to be appreciated by health-conscious and taste-conscious consumers (de Boer, Schösler, & Boersema, 2013; Jallinoja, Niva, & Latvala, 2016; Schneider, 2002). All of these are topics for further research.

One of the limitations of this study is that the number of meat eating days was combined with the preferred meat portion size as a proxy to estimate the average intake of meat per day. This approach was chosen because preferred meat portion sizes can meaningfully be asked for, without the complexities of different meal formats (Schösler et al., 2012), and because it provides a way to distinguish more than one category of meat eaters. The latter is in itself a strong point of the study in comparison with all the studies that compared vegetarians to indiscriminate groups of meat eaters. Another limitation is the way in which the vegetarians were identified. The question did not take into account that consumers may use more subtle labels to describe their food habits. A typical example is the term ‘flexitarian’, earliest documented occurrence 1992 (see Glowka, Melancon, & Wyckoff, 2004); this is a union of the words ‘flexible’ and ‘vegetarian’, which has been used by individuals who saw themselves as vegetarians occasionally eating meat. It should be noted, however, that the term has also been broadened to include the large



consumer group who does not eat meat every day (de Bakker & Dagevos, 2012), which makes it less useful for analytical purposes. Finally, the limitations of quota sampling should be acknowledged.

In conclusion, insights into the mindset and motivation of vegetarians and multiple categories of meat eaters can be used much more effectively to support the development of strategies for a transition to a less meat-based diet. This is relevant for (non) governmental organizations that aim to influence dietary choices, as well as for businesses that operate in the market of meat substitutes. There is an urgent need for meat moderation campaigns that provide a broad spectrum of measures and habit-breaking interventions, including the promotion of vegetarian options as culturally and nutritionally acceptable meals, the propagation of healthy, convenient and varied meat-free or meat-reduced products and recipes, and the development of adequate point-of-sale signals to be mindful of meat, such as price signals and origin labelling.

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Table 1

Characteristics of the two samples.

	Native Dutch sample		Chinese Dutch sample	
	<i>n</i>	%	<i>n</i>	%
<u>Gender</u>				
Men	172	48	164	47
Women	185	52	186	53
<u>Age</u>				
18 – 24 years	158	44	152	43
25 – 29 years	91	26	125	36
30 – 35 years	108	30	73	21
<u>Level of education</u>				
Low	20	6	42	12

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Middle	225	63	169	48
High	112	31	139	40
Still studying	155	43	150	43

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Table 2

Some characteristics of the dietary groups in the two samples.

	Self-declared vegetarians	Low meat- eaters	Medium meat- eaters	High meat- eaters	Total	$\chi^2$ or $F$
<u>Native Dutch</u>						
Number per group	24	118	137	78	357	
Percentage of the sample	7%	33%	38%	22%	100%	
<i>Underlying variables</i>						
Mean number of meat eating days (SD)	n.a.	2.46 (1.80)	4.36 (1.19)	5.87 (0.96)	3.77 (2.10)	
Mean preferred meat portion size (SD)	n.a.	90.3 (36.4)	124.8 (31.0)	166.0 (23.5)	123.2 (42.3)	
<i>Descriptive variables<sup>1)</sup></i>						
% Women	71% <sup>a</sup>	58% <sup>a</sup>	58% <sup>a</sup>	24% <sup>b</sup>	52%	$\chi^2 = 31.50, p < .001$
Mean age (SD)	27.0	25.2	26.3	25.8	25.8	$F = 1.42, p > .05$



	(5.3)	(5.1)	(5.1)	(5.2)	(5.2)	
% With high education	38%	30%	29%	35%	31%	$\chi^2 = 1.14, p > .05$
% Still studying	38% <sup>a, b</sup>	55% <sup>b</sup>	36% <sup>a</sup>	40% <sup>a</sup>	43%	$\chi^2 = 9.98, p < .05$

### Chinese Dutch

Number per group	19	53	126	152	350
Percentage of sample	5%	15%	36%	43%	100%
<i>Underlying variables</i>					
Mean number of meat eating days (SD)	n.a.	3.30 (1.88)	5.20 (1.32)	6.38 (0.91)	5.14 (2.03)
Mean preferred meat portion size (SD)	n.a.	78.9 (34.8)	113.9 (22.5)	166.1 (23.4)	132.4 (41.7)

### *Descriptive variables<sup>1)</sup>*

% Women	68% <sup>a</sup>	72% <sup>a</sup>	67% <sup>a</sup>	34% <sup>b</sup>	53%	$\chi^2 = 41.79, p < .001$
Mean age (SD)	23.3 <sup>a</sup>	26.0 <sup>a, b</sup>	26.6 <sup>b</sup>	25.2 <sup>a, b</sup>	25.7	$F = 3.66, p < .05$

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	(3.9)	(5.1)	(4.8)	(4.7)	(4.8)	
% With high education	37%	38%	38%	42%	40%	$\chi^2 = 0.65, p > .05$
% Still studying	63%	43%	40%	43%	43%	$\chi^2 = 3.72, p > .05$

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Note: n.a. means not applicable.

<sup>1)</sup> Means and percentages with different superscript letters (<sup>a</sup>, <sup>b</sup>, <sup>c</sup>) differ significantly (Bonferroni test,  $p < .05$ ).

Table 3

Some characteristics of the meals eaten by the dietary groups in the two samples.

	Self-declared vegetarians	Low meat- eaters	Medium meat- eaters	High meat- eaters	Total	$\chi^2$ and $V$
<u>Native Dutch (n = 357)</u>						
% With more than 1 hot meal per day	8%	14%	6%	6%	9%	$\chi^2 = 5.45, V = .12$
Reported eating beef	4% <sup>a</sup>	41% <sup>a, b</sup>	49% <sup>b</sup>	81% <sup>c</sup>	50%	$\chi^2 = 53.87, V = .39^{***}$
Reported eating pork	8% <sup>a</sup>	40% <sup>b</sup>	52% <sup>b, c</sup>	65% <sup>c</sup>	48%	$\chi^2 = 28.54, V = .28^{***}$
Reported eating lamb, sheep	4%	25%	18%	13%	18%	$\chi^2 = 8.87, V = .16^*$
Reported eating poultry	12% <sup>a</sup>	75% <sup>b</sup>	87% <sup>b</sup>	88% <sup>b</sup>	78%	$\chi^2 = 72.41, V = .45^{***}$
Reported eating fish	58% <sup>a, b</sup>	66% <sup>b</sup>	73% <sup>b</sup>	40% <sup>a</sup>	62%	$\chi^2 = 24.49, V = .26^{***}$
Reported eating meat substitutes	25% <sup>a</sup>	21% <sup>a</sup>	10% <sup>a, b</sup>	4% <sup>b</sup>	13%	$\chi^2 = 16.23, V = .21^{**}$

Thought of their meals as typically Dutch	62%	57%	41%	40%	47%	$\chi^2 = 10.53, V = .17^*$
<u>Chinese Dutch (n = 350)</u>						
% With more than 1 hot meal per day	37%	19%	18%	26%	22%	$\chi^2 = 5.37, V = .12$
Reported eating beef	0% <sup>a</sup>	55% <sup>b</sup>	64% <sup>b</sup>	81% <sup>c</sup>	67%	$\chi^2 = 55.54, V = .40^{***}$
Reported eating pork	0% <sup>a</sup>	49% <sup>b</sup>	80% <sup>c</sup>	96% <sup>d</sup>	78%	$\chi^2 = 122.45, V = .59^{***}$
Reported eating lamb, sheep	0% <sup>a</sup>	6% <sup>a</sup>	2% <sup>a</sup>	2% <sup>a</sup>	2%	$\chi^2 = 3.49, V = .10$
Reported eating poultry	0% <sup>a</sup>	92% <sup>b</sup>	98% <sup>b</sup>	97% <sup>b</sup>	91%	$\chi^2 = 215.74, V = .78^{***}$
Reported eating fish	0% <sup>a</sup>	81% <sup>b</sup>	75% <sup>b</sup>	45% <sup>c</sup>	59%	$\chi^2 = 63.31, V = .42^{***}$
Reported eating meat substitutes	79% <sup>a</sup>	17% <sup>b</sup>	6% <sup>b, c</sup>	5% <sup>c</sup>	11%	$\chi^2 = 102.87, V = .54^{***}$
Thought of their meals as	10%	23%	15%	4%	11%	$\chi^2 = 17.00, V = .22^{**}$

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 typically Dutch

Thought of their meals as	16%	40%	41%	36%	37%	$\chi^2 = 4.80, V = .12$
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 typically Chinese
 

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Note: Percentages with different superscript letters (<sup>a, b, c</sup>) differ significantly (Bonferroni test,  $p < .05$ ).

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

Table 4

Aspects of intrinsic motivation: Mean ratings (SD in parentheses) among the dietary groups in the two samples.

Items <sup>1)</sup>	Self-declared vegetarians	Low meat- eaters	Medium meat-eaters	High meat- eaters	Total	<i>F</i> and $\eta^2$
<u>Native Dutch (n = 357)</u>						
I prefer to prepare food myself because I want to eat everything as pure as possible.	4.96 <sup>a</sup> (1.49)	4.58 <sup>a</sup> (1.39)	4.28 <sup>a, b</sup> (1.37)	3.87 <sup>b</sup> (1.75)	4.34 (1.50)	<i>F</i> = 5.17, $\eta^2$ = .04, <i>p</i> = .002
I like to feel a personal connection with the person I buy my food from.	4.04 (1.68)	3.58 (1.54)	3.66 (1.42)	3.22 (1.57)	3.56 (1.52)	<i>F</i> = 2.37, $\eta^2$ = .02, <i>p</i> = .071
When I eat, I regularly pause to experience what something tastes like exactly.	3.79 (1.67)	4.22 (1.39)	4.28 (1.37)	4.04 (1.75)	4.17 (1.50)	<i>F</i> = 0.96, $\eta^2$ = .01, <i>p</i> = .410
I feel happy when I have time and attention to cook.	3.71 (1.52)	4.13 (1.38)	4.09 (1.45)	3.73 (1.75)	4.00 (1.51)	<i>F</i> = 1.49, $\eta^2$ = .01, <i>p</i> = .216

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Chinese Dutch ( $n = 350$ )

I prefer to prepare food myself	4.68	4.49	4.37	4.05	4.26	$F = 2.23, \eta^2 = .02,$
because I want to eat everything as	(1.29)	(1.34)	(1.58)	(1.45)	(1.48)	$p = .084$
pure as possible.						
I like to feel a personal connection	3.47	3.53	3.32	3.45	3.42	$F = 0.42, \eta^2 = .00,$
with the person I buy my food from.	(1.68)	(1.54)	(1.42)	(1.57)	(1.52)	$p = .739$
When I eat, I regularly pause to	4.58	4.55	4.72	4.27	4.49	$F = 2.51, \eta^2 = .02,$
experience what something tastes like	(1.26)	(1.20)	(1.50)	(1.37)	(1.40)	$p = .059$
exactly.						
I feel happy when I have time and	4.11	4.28	4.30	4.04	4.17	$F = 0.94, \eta^2 = .01,$
attention to cook.	(1.41)	(1.18)	(1.50)	(1.38)	(1.40)	$p = .421$

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<sup>1)</sup> Items are presented in decreasing order of agreement among the vegetarian natives. Ratings were made on a 7-points scale (1 = *completely disagree* to 7 = *completely agree*). Means with different superscript letters (<sup>a, b, c</sup>) differ significantly (Bonferroni test,  $p < .05$ ).

Table 5

Reasons for *not* frequently eating meat among the dietary groups in the two samples.

Items <sup>1)</sup>	Self-declared vegetarians	Low meat- eaters	Medium meat-eaters	High meat- eaters	Total	$\chi^2$ and $V$
<u>Native Dutch (n = 357)</u>						
I don't like meat very much <sup>†</sup>	71% <sup>a</sup>	36% <sup>b</sup>	24% <sup>b</sup>	19% <sup>b</sup>	30%	$\chi^2 = 27.83, V = .28^{***}$
I think animal welfare is important <sup>†</sup>	71% <sup>a</sup>	21% <sup>b</sup>	16% <sup>b</sup>	10% <sup>b</sup>	20%	$\chi^2 = 44.45, V = .35^{***}$
I like to vary <sup>†</sup>	38% <sup>a, b</sup>	45% <sup>b</sup>	39% <sup>b</sup>	15% <sup>a</sup>	36%	$\chi^2 = 19.21, V = .23^{***}$
It's healthier, not frequently eating meat	33%	38%	34%	20%	32%	$\chi^2 = 6.92, V = .14$
It's better for the environment	21%	30%	44%	41%	38%	$\chi^2 = 8.60, V = .16^*$
It is what I am used to <sup>†</sup>	21% <sup>a, b</sup>	28% <sup>b</sup>	17% <sup>a, b</sup>	9% <sup>a</sup>	19%	$\chi^2 = 11.72, V = .18^{**}$
Others in the household don't want to eat meat <sup>†</sup>	12% <sup>a, b</sup>	25% <sup>b</sup>	22% <sup>b</sup>	6% <sup>a</sup>	19%	$\chi^2 = 11.92, V = .18^{**}$
Because of my religion	4%	13%	10%	5%	10%	$\chi^2 = 4.01, V = .11$



Because of my finances	4% <sup>a</sup>	37% <sup>b</sup>	28% <sup>a, b</sup>	32% <sup>b</sup>	30%	$\chi^2 = 10.76, V = .17^*$
% With more than one reason	96% <sup>a, b</sup>	98% <sup>b</sup>	80% <sup>a</sup>	36% <sup>c</sup>	78%	$\chi^2 = 112.27, V = .56^{***}$
<u>Chinese Dutch (n = 350)</u>						
I don't like meat very much	47% <sup>a</sup>	15% <sup>b</sup>	15% <sup>b</sup>	7% <sup>b</sup>	13%	$\chi^2 = 24.62, V = .26^{***}$
I think animal welfare is important	68% <sup>a</sup>	15% <sup>b</sup>	13% <sup>b</sup>	14% <sup>b</sup>	17%	$\chi^2 = 39.23, V = .34^{***}$
I like to vary <sup>†</sup>	10% <sup>a, b</sup>	36% <sup>b</sup>	24% <sup>a, b</sup>	14% <sup>a</sup>	21%	$\chi^2 = 13.80, V = .20^{**}$
It's healthier, not frequently eating meat <sup>†</sup>	16% <sup>a, b</sup>	40% <sup>b</sup>	25% <sup>a, b</sup>	13% <sup>a</sup>	22%	$\chi^2 = 17.94, V = .23^{***}$
It's better for the environment <sup>†</sup>	42% <sup>a</sup>	38% <sup>a</sup>	32% <sup>a</sup>	15% <sup>b</sup>	26%	$\chi^2 = 17.85, V = .23^{***}$
It is what I am used to <sup>†</sup>	26%	11%	24%	17%	19%	$\chi^2 = 4.91, V = .12$
Others in the household don't want to eat meat <sup>†</sup>	0% <sup>a, b</sup>	13% <sup>b</sup>	6% <sup>a, b</sup>	2% <sup>a</sup>	5%	$\chi^2 = 11.84, V = .18^{**}$
Because of my religion	0%	8%	6%	3%	5%	$\chi^2 = 3.22, V = .10$
Because of my finances	5% <sup>a</sup>	42% <sup>b</sup>	36% <sup>b</sup>	41% <sup>b</sup>	37%	$\chi^2 = 9.55, V = .16^*$

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% With more than one reason	68% <sup>a</sup>	70% <sup>a</sup>	55% <sup>a</sup>	21% <sup>b</sup>	43%	$\chi^2 = 57.49, V = .40^{***}$
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<sup>1</sup>) Reasons for *not* frequently eating meat (up to a maximum of three reasons) were asked for. Items are presented in decreasing order of agreement among the vegetarian natives. Percentages with different superscript letters (<sup>a, b, c</sup>) differ significantly (Bonferroni test,  $p < .05$ ).

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

† Indicates a significant predictor of the low, medium and high meat-eaters in the final model of the multinomial logistic regression.

Table 6

Reasons for frequently eating meat among the dietary groups in the two samples.

Items <sup>1)</sup>	Low meat- eaters	Medium meat- eaters	High meat- eaters	Total	$\chi^2$ and $V$
<u>Native Dutch (n = 333)</u>					
It's healthier to eat meat frequently <sup>†</sup>	53% <sup>a</sup>	40% <sup>a, b</sup>	26% <sup>b</sup>	41%	$\chi^2 = 15.06, V = .21^{**}$
Being a meat lover	45% <sup>a</sup>	61% <sup>b</sup>	67% <sup>b</sup>	56%	$\chi^2 = 10.65, V = .18^{**}$
It fits well with what I normally eat	35%	33%	26%	32%	$\chi^2 = 1.90, V = .08$
It is what I am used to	30%	39%	45%	37%	$\chi^2 = 4.35, V = .11$
To get satiety	27%	33%	37%	32%	$\chi^2 = 2.30, V = .08$
Others in the household want to eat meat	20%	22%	15%	20%	$\chi^2 = 1.38, V = .06$
Not liking anything else	17%	20%	20%	19%	$\chi^2 = 0.61, V = .04$
It is a sign of being wealthy	16% <sup>a</sup>	10% <sup>a, b</sup>	3% <sup>b</sup>	10%	$\chi^2 = 9.17, V = .17^*$
The speciality of the occasion <sup>†</sup>	13% <sup>a</sup>	2% <sup>b</sup>	1% <sup>b</sup>	6%	$\chi^2 = 16.75, V = .22^{***}$
% With more than one reason	89%	89%	81%	87%	$\chi^2 = 3.62, V = .10$

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Chinese Dutch ( $n = 331$ )

It's healthier to eat meat frequently	11%	15%	20%	17%	$\chi^2 = 2.79, V = .09$
Being a meat lover <sup>†</sup>	36% <sup>a</sup>	48% <sup>a, b</sup>	57% <sup>b</sup>	50%	$\chi^2 = 7.71, V = .15^*$
It fits well with what I normally eat	40% <sup>a, b</sup>	48% <sup>b</sup>	28% <sup>a</sup>	38%	$\chi^2 = 12.83, V = .20^{**}$
It is what I am used to	57% <sup>a</sup>	45% <sup>a, b</sup>	34% <sup>b</sup>	42%	$\chi^2 = 8.97, V = .16^*$
To get satiety	28%	30%	26%	28%	$\chi^2 = 0.50, V = .04$
Others in the household want to eat meat	28% <sup>a</sup>	17% <sup>a, b</sup>	9% <sup>b</sup>	15%	$\chi^2 = 11.56, V = .19^{**}$
Not liking anything else	8%	14%	13%	13%	$\chi^2 = 1.58, V = .07$
It is a sign of being wealthy	2%	6%	1%	3%	$\chi^2 = 5.84, V = .13$
The speciality of the occasion	2%	3%	3%	3%	$\chi^2 = 0.28, V = .02$
% With more than one reason	72% <sup>a, b</sup>	81% <sup>b</sup>	59% <sup>a</sup>	70%	$\chi^2 = 15.51, V = .22^{***}$

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<sup>1</sup>) Items are presented in decreasing order of agreement among the low meat-eating natives. Reasons for frequently eating meat (up to a maximum of three reasons) were asked for. Percentages with different superscript letters (<sup>a, b, c</sup>) differ significantly (Bonferroni test,  $p < .05$ ).

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

<sup>†</sup> Indicates a significant predictor of the low, medium and high meat-eaters in the final model of the multinomial logistic regression.