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Meat Consumption and Vegaphobia: An Exploration of the Characteristics of Meat Eaters, Vegaphobes, and Their Social Environment

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Abstract: This article highlights the importance of the dietary pattern of significant others in one's social network to explain both individual meat consumption and vegaphobia, the negative and stigmatizing attitude toward vegetarianism and non-meat-eaters. Using survey data (N = 996), this study first contrasted convinced meat-eaters with non-meat eaters, or people who actively reduce or limit their meat consumption, in terms of different socio-demographic characteristics. Results showed that convinced meat eaters are more often male. A negligible effect on meat consumption was found for education, and age differences were not significant. Next, attention was paid to the social context of meat consumption. Specifically, results of a logistic regression analysis showed that a person's meat consumption is considerably lower when one of their household members is vegetarian. This was also the case, but to a lesser extent, if people's social circle included a vegetarian friend or family member. Similar results were found when looking at the linear correlates of vegaphobia using ordinary least squares regression (OLS). Vegaphobes were more often male and lower-educated. In addition, vegaphobia was more common among older persons and convinced meat eaters. Moreover, vegaphobia was less common among people who had a vegetarian in their household or groups of friends. The article ends with a discussion on the importance of studying the social environment in meat consumption and attitudes toward vegetarianism. Policy implications and directions for future research are discussed.

Keywords: meat consumption; vegaphobia; vegetarianism; social environment

1. Introduction

There is an increasing awareness of the potential negative impact of excessive meat consumption on the environment and health [1]. While some report a global rise in plant-based eating, at the same time, meat consumption is on the rise across the world [2]. The global average per capita consumption of meat is rising [3], and negative attitudes toward alternative diets do exist [4]. Vegetarian diets are generally perceived in a positive light [5], yet research suggests that there is a group of convinced meat eaters who are negative towards people who actively reduce or limit their meat consumption [6]. So far, studies have focused on stereotyping processes between meat eaters and meat avoiders, on what these stereotypes entail [7], why they perform this behavior [6], and how stereotyping can differ for vegetarians and vegans as targets [4], yet little is known about the socio-demographics of who is most likely to perform this behavior. The first aim of this study was therefore to identify the social-demographic characteristics of people that stereotype meat avoiders.

Next, these negative attitudes of avid meat eaters towards vegetarianism make it extremely difficult to convince this group to reduce their meat intake [8], despite the known benefits for their

own health and the global environment [1]. In general, people do not like to be told what to eat and what not to eat, and are rather unwilling to make dietary changes [5]. Changing to a meatless or meat-reduced diet may also trigger health concerns in avid meat eaters [5]. It has been suggested that rather than focusing on diet and health, a focus on the social environment of food consumption is a better avenue by which to endorse dietary changes [9]. Therefore, this study also aimed to identify the social-environmental factors that are associated with meat eating. Unraveling these factors can open up new pathways to endorse meat reduction in populations that need to reduce their meat intake.

Against this background, this study used recent data from a representative survey conducted among the Flemish population in Belgium to identify the socio-demographic characteristics that correlate with meat consumption and vegaphobia, i.e., the negative and stigmatizing attitude toward vegetarianism and non-meat eaters. In both cases, specific attention was paid to the role of the social environment by assessing the effect of the presence of vegetarians among people's households, wider family, friends, and colleagues. In what follows, we first offer the theoretical framework that guided our research. It is subdivided into two parts, focusing on: (i) meat consumption, and (ii) vegaphobia.

1.1. Meat Consumption

Meat was introduced into the human diet more than 2 million years ago, and the shift to an omnivorous diet including meat has been linked to the expansion of the human brain and increased sociality [10]. To some degree, meat has made us 'human,' i.e., extremely socially intelligent [11]. Both the acquisition and distribution of meat, and large game in particular, required increased cooperation and coordination [12]. Sharing and eating meat, and other foods that also remained important into the human diet, became the festive meals that have taken up an important position in the history of humans [13]. Today, meat still has a central place at many festive food gatherings [13], and many people are attached to meat in ways that go far beyond a mere taste preference [8]. For some, however, the consumption of meat is unacceptable. What sets vegetarians and vegans mostly apart from those who do eat meat is their concern for animal wellbeing [14]. Interestingly, our human capacity for morality has also been linked to the introduction of meat into the human diet [13]. Not cooperating in the acquisition of meat or not sharing meat fairly among the group may have helped to shape moral emotions such as anger, shame, and guilt [13]. The introduction of meat into the human diet enabled individuals to think about fairness, treating others fairly. For some, these 'others' also include animals.

Vegetarianism is not a modern phenomenon. Plant-based foods have a longer and more central position in the human diet than does meat [15]. Not eating meat because of animal or health concerns was common among the Ancient Greeks, and India also has a long history of vegetarianism. Buddha and Pythagoras both strongly believed it was wrong to kill for food [16]. In the Netherlands [17] and Belgium [18], vegetarianism became more prominent towards the end of the 19th century. The end of World War II brought an end to blossoming times of vegetarianism, and meat consumption majorly increased in the second half of the 20th century. An upsurge of vegetarianism occurred in the 1960s and 1970s, with the emergence of the environmental and animal rights movements. One of the first and most influential publications with reference to the inefficiency of an animal diet is the report *The Limits to Growth*, published in 1972 by the Club of Rome [19]. At that time, similar voices also sounded from an anthropological angle. French anthropologist Claude Lévi-Strauss, for example, spoke of an inevitable vegetarian future as early as the 1980s. He put it as follows [20]:

> *"The day will come when the idea that, in the past, in order to feed themselves, men raised and slaughtered living beings and displayed their flesh complacently in pieces in shop windows, will undoubtedly inspire the same repulsion that the explorers in the 16th or 17th centuries experienced, when they encountered the cannibalistic meals of American, Oceanic or African savages." [Lévi-Strauss 2001:11, own translation].*

Since then, popular science books, including Peter Singer's [21] *Animal Liberation* and Jonathan Safran Foer's [22] *Eating Animals*, openly questioned animal consumption and raised more awareness

to broader audiences. More recently, the debate about meat consumption has shifted away from the focus on animal-wellbeing towards a stronger focus on climate change [23]. It now is a recurring argument that, in addition to other measures like technological improvements and the halving of food loss and waste, changes towards plant-based flexitarian diets are fundamental to tackling problems like deforestation, water shortages, and greenhouse gases from livestock [24]. With an estimated 10 billion people in 2050, the societal and scientific call for a sustainable food system sounds louder than ever before. This is partly mirrored in what we think about climate change and its causes, like meat consumption, yet this is less clearly translated into our behavior. For example, results from the *Belgian National Food Consumption Survey* have shown that only 1.7% of Belgians report to have 'a diet poor in animal products' [25]. Recent studies among the Belgian population have also shown that vegetarians remain a minority group [26]. The same applies to the Netherlands, with a slightly higher percentage of 4.5% vegetarians [27]. Although recent polls indicate the existence of an upward trend, with around 10% vegetarians in countries like Germany, Canada, and the United States [28–30], a large gap remains between what we *do* and what we *think* about meat consumption.

Several authors, including Jared Piazza and his colleagues [31], have been searching for explanations for what they describe as "the meat paradox." Meat eaters experience a moral dilemma. On the one hand, meat eaters know that eating meat causes damage to animals. On the other hand, they also enjoy eating meat. The cognitive dissonance between "eating animals" and "harming animals" is resolved through different rationalization techniques. Specifically, meat eaters have been shown to justify their behavior by 4Ns: i.e., the practice of meat eating is rationalized as *natural*, *normal*, *necessary*, and *nice*. What is implicitly present in the research of Piazza et al. [31] is the search for a general law that applies to a very large number of people, in this case, to the undifferentiated group of omnivores. In our study, however, we assumed that omnivores should not be approached as a homogeneous category. Instead, taking a sociological (rather than a moral-psychological) stance, we assumed that people and their eating patterns can vary according to their social positions and sociocultural milieu. This shift in focus is important given the advice that dietary changes are hard, if not impossible, to achieve when focusing on knowledge and attitudes, whereas a focus on the social aspects of food and eating gives better results [9]. It is therefore timely and necessary to get a better understanding not just of the individual mental processes related to meat consumption, but also to the broader sociological context wherein food, and, in this case, meat, is consumed.

In order to account for the social-contextual factors in eating habits, connection can be found to the work of the French sociologist Pierre Bourdieu. In *La Distinction* [32], he exposes, among other things, the relationship between people's social position and the food choices they make. For example, an increase in status within the social hierarchy, and an increase in cultural capital in particular, would be accompanied by a lower consumption of fatty and cheap products such as potatoes, bacon, and pork. Instead, it would be more common to consume lighter foods such as veal and lamb, but especially fresh fruits and vegetables. With regard to income, however, research has shown that other factors, such as perceived quality, may be relatively more important [33]. Research by Gossard and York [34] further showed that meat consumption is more common among blue-collar than white-collar workers. This study also showed that meat consumption is negatively related to educational background, or what Bourdieu termed institutionalized cultural capital. Chan and Zlatevska [35] recently argued that meat may be a substitute for a perceived lack of socioeconomic status. Accordingly, in the study by Hoek et al. [36], it was shown that vegetarians are mainly higher educated and have a higher socio-economic status. The latter study also found vegetarians to be mainly female. In another study by Schösler et al. [37], a positive relationship was found between meat consumption and perceived masculinity. Finally, there seems to be less consensus with regard to the role of age. The study by Fraser et al. [38] suggested that older people more often eat (red) meat, and that younger people are more likely to consume vegetarian foods. However, in another study by Daniel et al. [39], the relationship between meat consumption and age was found to be curvilinear instead, with meat consumption peaking in adults aged 20 to 49 years.

1.2. Vegaphobia

Vegetarians and vegans remain a minority group across the globe, but they are growing in numbers, and their voices are getting louder [40]. At the same time, meat consumption is also still on the rise, and the groups of vegetarians/vegans and avid meat eaters are growing further apart [40]. Although vegetarian diets may be generally perceived in a positive light, significant differences can exist between specific sociodemographic groups [40]. Some vegetarians and vegans become rather extreme in their behavior, avoiding close physical contact with those who eat meat [41]. However, meat eaters too may develop strong negative thoughts and feelings towards vegetarians and vegetarianism [6], to the extreme that some even talk about 'vegaphobia.' One of the first explicit references to vegaphobia can be found in the study of the British sociologists Matthew Cole and Karen Morgan [42] (p.134), in which they relate vegaphobia to "a derogatory portrayal of vegans and veganism." From their media analysis of discourses of veganism in UK national newspapers, Cole and Morgan concluded that a large majority of the newspapers represented veganism and vegans in a bad light. In these negative representations, veganism is seen as ridiculous, self-abstinent, difficult and impossible to sustain, a fashionable phenomenon, hypersensitive, or even hostile. These findings cannot be dealt with superficially, because, as Cole and Morgan argue, media like newspapers may fulfill an important role in the cultural reproduction of speciesism, i.e., discrimination based on species membership [42,43].

In this article, we extend the meaning of the concept of vegaphobia to also include negative attitudes toward vegetarianism and vegetarians. In addition, we looked for the factors that relate to this new expression of speciesism. Although existing research on vegaphobia is scarce, connections can be found to a number of recent psychological and moral-philosophical studies. For example, in *Voir son steak comme un animal mort*, Martin Gibert [44] links the negative portrayal and perception of non-meat eaters to cognitive dissonance. The vegaphobe, according to Gibert, is not so much afraid of vegetarians, but afraid of being convicted. In his words, a vegaphobe *"blames the vegetarian for reminding him of his cognitive dissonance. Even before the vegetarian has said a word, he forces the omnivore to acknowledge that consuming animals is a choice."* [44] (pp. 134–135, own translation). In another (social-)psychological study, vegaphobia was related to so-called "do-gooder derogation," the putting down of morally motivated others [45]. Meat eaters would expect vegetarians to see themselves as morally superior to nonvegetarians. In accordance with the study of Gibert, a vegaphobic attitude would thus indirectly stem from the feeling of being morally judged.

Sociological research on speciesism further shows that animal oppression is not only internalized by the individual, but also institutionalized in our society. In *Animal Rights/Human Rights*, the sociologist David Nibert calls for a social constructivist approach of speciesist reality [46]. The oppression of non-human animals, as Nibert argues, is "part of a tightly woven set of cultural practices that are deeply established in social arrangements" [46] (p. 4). In this article, we have built on this basic sociological argument by examining the sociodemographic characteristics of convinced meat eaters, vegaphobes, and their social environments.

Little research exists on sociodemographic differences in attitudes towards vegetarians and vegetarianism. The study by Merriman [47] is an exception, showing that men and women receive different reactions from others when they identify as vegetarian. Female vegetarians, so it seems, would experience more hostility than male vegetarians. This hostility, indicative of vegaphobia, was mainly expressed by men. Caution is needed, as these are the conclusions drawn from only one study. Even less is known, however, about the potential roles of other sociodemographic factors, such as age and educational background. We therefore examined the sociodemographic characteristics gender, age, and education, which correlate with meat consumption and vegaphobia. In addition, the role of the social environment was explored by looking at the presence of vegetarians in people's groups of friends, among colleagues, in people's households, and in the wider family.

The relationship between characteristics of people's social environment on the one hand, and both meat consumption and vegaphobia on the other hand, entails both voluntarist and structuralist explanations. First, and in line with the above hypothesis by Gibert [44], it may be that, as social

interaction with vegetarians increases, the cognitive dissonance experienced by convinced meat eaters will be reinforced. In other words, social contact with dissimilar others may strengthen cognitive dissonance. In this view, meat consumption as a choice is set aside by the creation of social bonds with like-minded individuals. We can expect that this proactive and agency-driven explanation will mainly apply in situations where there is a certain autonomy or freedom of choice, e.g., when making friends and thereby establishing the so-called "family of choice." On the other hand, meat consumption has been institutionalized to such an extent that social relations may also have a structuring impact on our diet, and on the way in which convinced meat eaters look at dissimilar others. In the view of Nibert [46], the institutionalized oppression of animals happens through ideologies that are largely steered and maintained through political and economic elites. In this study, however, we put forward the hypothesis that diet and vegaphobia may also be partially conditioned by social networks. For many people, eating meat can be a forced choice, caused by social pressure. The presence of one vegetarian family member can then suffice to relieve the social pressure to eat meat. Specifically, we aimed to explore the hypothesis that the presence of vegetarians in people's social environments will play an important role in the denormalization of meat consumption. Similarly, we can assume that the presence of vegetarians in people's social networks will be accompanied by lower levels of vegaphobia.

Previous research has shown that people are less inclined to eat meat when they have vegetarians among their group of friends [48]. In another study, the intention to eat less beef by women seemed to be strongly affected by the respondent's partners and friends [49]. According to others, the presence of a vegetarian family member can also be a cause of conflict [50]. Family structures may get disturbed when someone in the household changes his or her diet to vegetarian, as the vegetarian family member no longer (fully) participates in the highly emotionally valued food traditions [51].

2. Materials and Methods

The analyses in this article are based on a survey carried out on behalf of a voluntary society organization named the Ethical Vegetarian Alternative (EVA). This non-profit association, which is based in the city of Ghent, Belgium, promotes vegetable nutrition through various activities and campaigns. Its main objective is to make people's eating and cooking behavior more sustainable by focusing on the benefits of a vegetarian diet for people's health, the environment, for other people, and problems of hunger, and for animals like pigs, fish, cattle, and chickens. It was founded in the year 2000, and today has become the second largest vegetarian organization in Europe.

In 2016, EVA asked the independent research bureau iVox, by far the largest Belgian research access panel, with over 150,000 participants, to conduct an online survey. The panel members that were invited to participate in this survey were selected via quota sampling that aimed at representativeness for the Flemish population of Belgium in terms of gender, age, education, and province. The percentages shown in Table 1 indicate that our quota sample corresponded well with the characteristics of the population that lives in the Flemish region of Belgium [52,53]. Specifically, the dataset that we used included slightly more younger people, it contained the same gender distribution as in the Flemish population, and it was very similar in terms of educational level. In addition, with regard to geographical distribution by province, the percentages were nearly identical.

Within ten days of sending out the first invitations, two reminder rounds were scheduled, resulting in a total sample of 996 cases. For reasons of transparency, the funding body was briefly mentioned beforehand. Social desirability bias was partially remediated by framing the study's purpose in a neutral manner. Specifically, the study was framed as an online survey in order "to find out more about the eating habits of Belgians." In addition, in the framing of the survey questions and possible answering options, no negative connotations were attached to specific dietary choices (whether pro-meat or plant-based diets).

The online questionnaire, designed by the non-profit organization EVA in collaboration with iVox, was conducted among women and men aged 18 years or older. In the sample there was an equal distribution between men (49.9%) and women (50.1%). Age was measured using three age

groups: young adults (18 to 29 years), middle-aged (30 to 49 years), and older adults (≥50 years). Furthermore, education was measured categorically with response options: lower secondary or less, higher secondary school, and higher education. In terms of age, the largest group in our sample, with 45%, was 50 years of age or older. In addition, 36% of the study participants were between 30 and 49 years of age, and 19% were 29 years of age or younger. About one third of the sample consisted of people with higher education (34.8%). These distributions are in line with the general characteristics of the Flemish population of Belgium [52,53].

Table 1. Comparison of sample and population characteristics.

	Sample (N = 996)	Population (Belgium, Flemish Region) *
Gender (% male)	49.9%	49.5%
Age (%)		
18–29	19%	17.6%
30–49	36%	32.4%
50+	45%	50.0%
Education (%)		
Higher educated	34.8%	34.0%
Province		
Antwerp	29.1%	28.2%
Limburg	11.9%	13.3%
East Flanders	22.8%	23.0%
West Flanders	17.3%	18.2%
Flemish Brabant	18.9%	17.3%

* Based on: 'Statistics Flanders': www.statistiekvlaanderen.be and 'Eurostat': ec.europa.eu/eurostat.

Meat consumption was measured by asking people about their dietary patterns. A distinction was made between convinced meat eaters (i.e., "I eat meat or fish almost every day," n = 838) on the one hand, and non-meat eaters like vegetarians ("I don't eat meat and fish," n = 13), near-vegetarians ("I eat meat or fish a maximum of two times a month," n = 21), and vegans ("I don't eat animal products," n = 3) on the other hand. Another group, the flexitarians, can be situated between convinced meat eaters and vegetarians. Although there is no single definition of the flexitarian diet, it is clear that flexitarians eat less meat than meat eaters, but more meat and/or fish than vegetarians [54,55]. In this study, the following eating patterns were classified as flexitarian: "I do not eat meat, but I do eat fish" (pescatarian, n = 18); and "I don't eat meat or fish at least three times a week" (part-time vegetarian, n = 103). Given the skewed distribution of this variable, and the limited number of cell frequencies in most of its categories, in subsequent analyses, the variable for meat consumption was dichotomized by distinguishing convinced meat eaters (score 1) from people who actively reduce or limit their meat consumption: i.e., flexitarians, (near-) vegetarians, and vegans (score 0).

Vegaphobia, the negative and stigmatizing attitude toward vegetarianism and non-meat-eaters, was measured by the following four items: (i) I find people who do not eat meat and fish weird; (ii) When I cook for others, I do not take into account whether there are vegetarians among them. They have to eat whatever I make; (iii) I wouldn't like it if my children wanted to become vegetarians; and (iv) Vegetarianism is a temporary trend that will blow over. These statements were answered on a seven point Likert scale (ranging from 1 = totally disagree to 7 = totally agree). To develop the measure for vegaphobia, a principal component analysis was performed (PCA). The cases were listwise excluded, making the overall sampling size N = 979. The scree plot further indicated the retention of one underlying factor, which explained 55.34% of the variance. Screening the correlation matrix taught us that correlations across the items varied from 0.35 (min.) to 0.57 (max.). The component loadings, i.e., the correlations between the four items and the component, varied between 0.68 and 0.81. A reliability analysis further indicated that the composite measure of vegaphobia was internally

consistent with a Cronbach's alpha value of 0.72. The KMO statistic, a measure of sampling adequacy, showed a score of 0.73, which ensured that factor analysis was appropriate for these data. In addition, the diagonal values of the anti-image correlation matrix were above 0.6, further indicating that there was no need to exclude any of the four items from the analysis. Furthermore, Bartlett's test of sphericity was highly significant ($p < 0.001$), indicating that the R-matrix was not an identity matrix, which reaffirmed the appropriateness of this factor analysis.

The two variables being tested in this study were meat consumption and vegaphobia. At the independent level, the estimated models included the variables gender, age, and education. In addition to these socio-demographic characteristics, *the presence of a vegetarian in people's social surrounding* was tested as an additional independent variable. Before answering the questions, a brief description was given, defining vegetarians as 'people who don't eat meat and fish.' This concerned a vegetarian in (i) the household, (ii) the wider family, (iii) the group of friends, and (iv) among colleagues. This resulted in four dummy variables, in which the value 'present' was assigned in the case of the presence of at least one vegetarian household member (dummy 1), at least one vegetarian family member (dummy 2), at least one vegetarian friend (dummy 3), and at least one vegetarian colleague (dummy 4).

The statistical analysis was carried out using SPSS (Statistical Package for the Social Sciences, version 25). The aim of this analysis was twofold. First, to examine the variables that correlated with meat consumption. For this purpose, a logistic regression analysis was performed to compare convinced meat eaters on the one hand, with vegetarians, flexitarians, and vegans on the other hand. Second, a multiple linear regression analysis was conducted to predict negative attitudes towards vegetarianism and non-meat eaters. In both cases, i.e., the logistic and linear models that estimated variation in respectively meat consumption and vegaphobia, specific attention was paid to sociodemographic characteristics (gender, age and education) as well as to the role of the social environment—i.e., the presence of vegetarians in a person's household, wider family, group of friends, and colleagues.

3. Results

The descriptive statistics are summarized in Table 2. It is shown that meat lovers and meat avoiders were similar in age and household size. However, there also appeared to be differences between the groups. Firstly, 54% of the convinced meat eaters were male, compared to only 27.5% of the meat avoiders. Secondly, a larger proportion of the meat avoiders were highly educated (45.7% post-secondary education) compared to the convinced meat eaters (32.8%). Thirdly, meat avoiders more often had vegetarians in all domains of their social network. Finally, meat avoiders scored lower on vegaphobia than convinced meat eaters.

Table 2. Descriptive statistics (N = 996).

	Total Sample (N = 996)	Convinced Meat Eater (N = 842)	Non-Convinced-Meat-Eater (N = 154)
Household size (M)	2.77	2.78	2.73
Age (%)			
≤29	19.0	19.1	18.5
30–49	36.0	36.0	35.5
50+	45.0	44.8	45.9
Gender (% male)	49.9	54.0	27.5
Educational level (%)			
Lower secondary or less	22.3	22.5	21.4
Secondary school	42.9	44.7	32.9
Higher education	34.8	32.8	45.7

Table 2. *Cont.*

	Total Sample (N = 996)	Convinced Meat Eater (N = 842)	Non-Convinced-Meat-Eater (N = 154)
Vegetarians in social network (%)			
Household	10.5	5.7	37.5
Family	29.5	25.8	49.9
Friends	53.3	49.5	73.8
Colleagues	33.9	31.9	45.2
Vegaphobia (M)	0	0.16	−0.96

Before looking at the multivariate relationships, we used correlation coefficients to explore bivariate associations. Results indicate that being a convinced meat eater is negatively associated with gender (cf. Table 3), suggesting that it is more common among men than among woman ($r = -0.154$; $p < 0.001$). In addition, meat consumption seems to be less common among the higher educated ($r = -0.110$; $p < 0.001$). The correlations between being a convinced meat eater and the different age groups were not significant. The presence of vegetarians in the social environment was negatively correlated with being a convinced meat eater. This suggests that meat consumption is less common among people who have vegetarians in their household ($r = -0.354$; $p < 0.001$), wider family ($r = -0.181$; $p < 0.001$), group of friends ($r = -0.161$; $p < 0.001$), and among their colleagues ($r = -0.091$; $p < 0.01$).

To further map the social differences between convinced meat eaters (score = 1) on the one hand, and flexitarians, (near-)vegetarians, and vegans (score = 0) on the other hand, a logistic regression analysis was performed. The analysis was built up in a stepwise manner. In the first step, the sociodemographic variables age, gender, and education were included as independent variables. In a second step, the model was extended with variables that estimated the role of the social environment. More specifically, the presence of vegetarians in the household, wider family, group of friends, and among colleagues was tested. Each of these cases concerned a dummy variable with 'no vegetarian present' as the reference category. The results of this logistic regression are shown in Table 4.

In the initial step, we examined the sociodemographic determinants of meat eaters based on odds ratios. In line with the correlation analysis, we note that there was no signification relationship between dietary patterns and household size or age. Gender, however, significantly predicted the odds of being a convinced meat eater ($p < 0.001$). Specifically, being a woman (in comparison to being a man) decreased the odds of being a convinced meat eater by 61.2%. For higher educated persons, the odds of being a convinced meat eater were 39.7% lower than the odds for those with a highest degree of higher secondary education ($p < 0.05$). No significant difference was found between the latter group and people with a highest degree of lower secondary education or less.

In the second step, we examined the role of vegetarians in the social environment, respectively in the household, wider family, group of friends, and among colleagues. We first note that the effect of gender remained quasi unchanged after controlling for the presence of vegetarians in the social environment. However, the effect of being higher educated disappears in the second step, with a p-value slightly higher than 0.05 (i.e., Exp(B) = 0.631; p = 0.056). Results further show that when another household member was vegetarian, the odds of being a convinced meat eater decreased by 89.3% ($p < 0.001$). There thus exists a strong negative association between the presence of a vegetarian household member and being a convinced meat eater, after controlling for household size. The same held true, but to a lesser extent, for the presence of a vegetarian family member (Exp(B) = 0.555, $p < 0.01$) and a vegetarian friend (Exp(B) = 0.432; $p < 0.001$). Only the presence of a vegetarian among colleagues did not seem to be significantly associated with dietary patterns.

Table 3. Full correlation matrix.

Correlates	Household Size	≤29	30–49	50+	Gender (Female)	Lower Secondary Education or Less	Higher Secondary Education	Higher Education	Vegetarians among Household	Vegetarians among Family	Vegetarians among Friends	Vegetarians among Colleagues	Convinced Meat Eater	Vegaphobia
Household size	1	0.292 ***	0.019	−0.246 ***	0.012	−0.170 ***	0.085 *	0.062	−0.023	0.030	0.066	−0.085 *	0.008	−0.038
≤29	0.292 ***	1	−0.357 ***	−0.435 ***	−0.024	−0.136 ***	0.063	0.054	−0.048	−0.032	0.077 *	0.046	0.037	−0.108 **
30−49	0.019	−0.357 ***	1	−0.686 ***	0.008	−0.211 ***	0.057	0.126 ***	−0.043	−0.075 *	0.067	0.134 ***	−0.017	0.028
50+	−0.246 ***	−0.435 ***	−0.686 ***	1	0.011	0.309 ***	−0.104 **	−0.164 ***	0.079 *	0.097 **	−0.124 ***	−0.165 ***	−0.012	0.058
Gender (female)	0.012	−0.024	0.008	0.011	1	0.018	−0.082 *	0.069 *	0.061	0.033	0.047	−0.025	−0.154 ***	−0.154 ***
Lower secondary education or less	−0.170 ***	−0.136 ***	−0.211 ***	0.309 ***	0.018	1	−0.463 ***	−0.398 ***	0.092 **	−0.051	−0.142 ***	−0.180 ***	0.007	0.016
Higher secondary education	0.085 *	0.063	0.057	−0.104 **	−0.082 *	−0.463 ***	1	−0.628 ***	−0.064	0.023	−0.103 **	−0.100 **	0.101 **	0.133 ***
Higher education	0.062	0.054	0.126 ***	−0.164 ***	0.069 *	−0.398 ***	−0.628 ***	1	−0.014	0.021	0.231 ***	0.262 ***	−0.110 ***	−0.152 ***
Vegetarians among household	−0.023	−0.048	−0.043	0.079 *	0.061	0.092 *	−0.064	−0.014	1	0.205 ***	0.062	0.061	−0.354 ***	−0.233 ***
Vegetarians among family	0.030	−0.032	−0.075 *	0.097 **	0.033	−0.051	0.023	0.021	0.205 ***	1	0.165 ***	0.134 ***	−0.181 ***	−0.148 ***
Vegetarians among friends	0.066	0.077 *	0.067	−0.124 ***	0.047	−0.142 ***	−0.103 **	0.231 ***	0.062 *	0.165 ***	1	0.379 ***	−0.161 ***	−0.185 ***
Vegetarians among colleagues	0.085 *	0.046	0.134 ***	−0.165 ***	−0.025	−0.180 ***	−0.100 **	0.262 ***	0.061	0.134 ***	0.379 ***	1	−0.091 **	−0.099 **
Convinced meat eater	0.008	0.037	−0.017	−0.012	−0.154 ***	0.007	−0.101 **	−0.110 ***	−0.354 ***	−0.181 ***	−0.161 ***	−0.091 **	1	0.311 ***
Vegaphobia	−0.038	−0.108 **	0.028	0.058	−0.154 ***	0.016	0.133 ***	−0.152 ***	−0.233 ***	−0.148 ***	−0.185 ***	−0.099 **	0.311 ***	1

Note: * p < 0.05; ** p < 0.01; *** p < 0.001.

Table 4. Logistic regression. Convinced meat eater (N = 868).

Model	Model 1		Model 2	
	Exp (B)	**Sig.**	**Exp (B)**	**Sig.**
Household size	1.036	0.664	1.061	0.500
Age (ref. cat.: ≤29 years)	Ref.		Ref.	
30–49	0.879	0.648	0.845	0.586
50+	0.934	0.812	1.050	0.880
Man	Ref.		Ref.	
Woman	0.388	0.000 ***	0.383	0.000 ***
Education (ref. cat.: higher secondary education)	Ref.		Ref.	
Lower secondary education or less	0.901	0.699	1.008	0.979
Higher education	0.603	0.020 *	0.631	0.056
Vegetarian in household			0.107	0.000 ***
Vegetarian among family (not household)			0.555	0.009 **
Vegetarian among friends			0.432	0.001 ***
Vegetarian among colleagues			0.960	0.862
Constant	11.525	0.000 ***	31.693	0.000 ***
Model Information				
−2LL (df)	720.398 (6) ***		603.981 (10) ***	
Nagelkerke R Square	6.2%		27.1%	

Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

The variables that measured the presence of vegetarians in people's social environments strongly contributed to the explained variation in the model. Specifically, by moving from the first to the second model, Nagelkerke R^2 increased from 6.2% to 27.1%. In other words, one fifth of the explained variance in meat consumption was related to the diet of significant others in people's social environments.

In the next part of the analysis, we identified the socio-demographic characteristics associated with vegaphobia, as well as examining the role of the social environment. Furthermore, we investigated the relationship between vegaphobia and dietary patterns, i.e., being a flexitarian, (near-)vegetarian, and vegan (score 0) or a convinced meat eater (score 1). The correlation matrix (cf. Table 3) first show that vegaphobia significantly correlated with age. Vegapobia was relatively less common among people under 30 years (r = −0.108; p < 0.001). In addition, vegaphobia seemed to be negatively correlated with gender (r = −0.154; p < 0.001) and higher education (r = −0.152; p < 0.001), suggesting that it is less common among woman and the higher educated. Furthermore, the presence of vegetarians in people's social environments was also negatively correlated with vegaphobia. Attitudes toward vegetarianism and vegetarians seemed to be mainly associated with the presence of vegetarians in the household (r = −0.233; p < 0.001) and among friends (r = −0.185; p < 0.001). Additionally, vegaphobia was positively related to dietary patterns, suggesting that it was more common among convinced meat eaters (r = 0.311; p < 0.001).

To further map the social differences in vegaphobia, a multiple linear regression analysis was conducted. The analysis was performed in a stepwise manner. In the first model, sociodemographic characteristics were included as independent variables. In the second step, the variable for meat consumption was added, and in the third and final model, the dummy variables for the presence of vegetarians in the social environment were included (cf. Table 5).

In the first step, the standardized regression coefficients indicate that older people scored higher on the vegaphobia-scale. In comparison with people under 30, people between 30 and 50 were more vegaphobic (std. β = 0.135; p < 0.01). The same held true for people aged 50 or older (std. β = 0.143; p < 0.01). In general, women were less vegaphobic than men (std. β = −0.145; p < 0.001). In addition, higher education had a negative relation with vegaphobia (std. β= −0.160; p < 0.001). In the second model, it was further shown that convinced meat eaters scored significantly higher on the vegaphobia scale (std. β = 0.285; p < 0.001). By adding the influence of one's own dietary preferences, the explained

variance in vegaphobia increased from 5.1% to 12.9%. In the third step, we examined the role of the social environment. After controlling for household size, the presence of a vegetarian in the household was negatively related to vegaphobia (std. β = −0.136; p < 0.001). The presence of a vegetarian in the group of friends (std. β = −0.098; p < 0.01) or wider family (std. β = −0.068; p < 0.05) was also negatively related to vegaphobia. The presence of a vegetarian among colleagues was not significantly related to negative attitudes toward vegetarianism and vegetarians. In this final model, the explained variance increased to 16%.

Table 5. Multiple linear regression. Vegaphobia (N = 854).

Model	Model 1		Model 2		Model 3	
	Std β	Sig.	Std β	Sig.	Std β	Sig
Household size	−0.004	0.918	−0.004	0.910	0.003	0.938
Age (ref. cat.: ≤29 years)	Ref.		Ref.		Ref.	
30–49	0.135	0.004 **	0.146	0.001 ***	0.142	0.001 ***
50+	0.143	0.004 **	0.157	0.001 ***	0.163	0.001 ***
Man	Ref.		Ref.		Ref.	
Woman	−0.145	0.000 ***	−0.103	0.001 ***	−0.101	0.002 **
Education (ref. cat.: higher secondary education)	Ref.		Ref.		Ref.	
Lower secondary education or less	−0.061	0.107	−0.053	0.148	−0.053	0.143
Higher education	−0.160	0.000 ***	−0.127	0.000 ***	−0.112	0.002 **
Convinced meat-eater			0.285	0.000 ***	0.211	0.000 ***
Vegetarian in household					−0.136	0.000 ***
Vegetarian among family (not household)					−0.068	0.039 *
Vegetarian among friends					−0.098	0.005 **
Vegetarian among colleagues					−0.000	0.990
Constant		0.566		0.000 ***		0.027 *
Model Information						
SS Regression (df)	49.367 (6) ***		116.456 (7) ***		145.694 (11) ***	
SS Residual (df)	805.497		738.409		709.170	
Adjusted R Square	5.1%		12.9%		16.0%	

Note: * p < 0.05; ** p < 0.01; *** p < 0.001.

4. Discussion and Conclusions

The aim of this study was to identify social-demographic and social-environmental factors associated with meat eating. In doing so, we wished to gain a better understanding of those who are most resistant to vegetarianism. It is also important to know the demographics of convinced meat eaters to target specific groups in health promotion initiatives [5]. Furthermore, this also enables us to explore some pathways that could be used in future interventions aimed at encouraging meat-reduced diets, as it has been suggested that a focus on the social environment of food consumption may be more successful as compared to a focus on diet and health directly [9].

Using survey data, this study showed that vegaphobes are most often (older) lower educated men who eat meat almost every day. To start with age, the results of this study showed that age does not predict meat consumption frequencies, but older people scored higher on vegaphobia compared to younger people. It is possible, however, that the effect of age on vegaphobia concealed the role of generational differences. Further research is warranted to distinguish between age and cohort effects. Second, as compared to participants with higher education, those with lower levels of education in this study scored higher on vegaphobia. At first glance, this can be connected to previous research that has shown that meatless diets are more common among populations with higher education [36,56]. To explain this, Chan and Zlatevska [35] recently suggested that meat consumption may compensate for a perceived lack of socioeconomic status. In addition, it is often argued that meat might have a

more prominent role in the diet of the less educated, because they are more often employed in manual labor. Consequently, they would consume more fatty products to sustain them throughout the day. However, our findings suggested that educational differences seem rather subtle and may nowadays appear at the level of attitudes rather than behavior. Third, both meat lovers and vegaphobes were more likely to be men than women. This confirms earlier findings that men are more attached to meat as compared to women [8]. Moreover, more than women, men believe that a meal without meat is not a proper meal [57], that meat eating is 'natural' for humans to do [58], and that it makes them strong and 'manly' [59]. In general, people associate meat with masculinity [60], and vegetarianism with being less masculine [61,62]. In his work on meat eaters' feelings and attitudes towards vegetarians, Rothgerber [6] did not mention any gender differences. With few exceptions [5,42,47], this study is one of the first to demonstrate that men score higher on vegaphobia as compared to women.

The results of this study further show that meat consumption is not driven purely by individual choices and social-demographic characteristics, but that it is also strongly and significantly related to the dietary choices made by significant others in one's social network. Our analyses are among the first to empirically assess the relevance of the social environment in meat consumption and attitudes toward vegetarianism. Specifically, it was shown that a person's meat consumption was considerably lower when one of their household members was vegetarian. This was also the case, but to a lesser extent, if people's social circle included a vegetarian friend or family member. In addition, vegaphobia was less common among people who had a vegetarian in their household, wider family, or group of friends. Social network variables seemed especially important in the case of food behavior (i.e., meat consumption) rather than attitudes (i.e., vegaphobia), where more than one fifth of the variance in individual meat consumption could be statistically explained by the diets of significant others. Our findings suggest that network homophily may foster and strengthen divides between us (convinced meat eaters) and them (flexitarians, vegetarians, and vegans). Stated differently, heterophily in social networks may be crucial to changing meat consumption habits. As has suggested, focusing on socio-cultural aspects of food and eating may be an avenue worthy of further investigation for dietary interventions [9]. The results of this study further support this idea. We encourage (policy) health workers to focus more on the social context of individuals and reaping the benefits whenever possible. Households where one person eats meat and others do not sometimes complain about not being able to cook a meal to share [26], but perhaps we need to think more about positing vegetarian meals as the norm, at least on some occasions. We could encourage families to cook vegetarian or vegan meals to share at least once a week. We could encourage people to cook vegetarian meals when having friends for dinner. We still associate meat with festive meals too rapidly [13], and perhaps it is timely and necessary to change that. In the end, we all eat mostly plant-based foods. If meat is what sets some people apart, then why not focus on the foods that can unite us? Lastly, we did not find a significant influence of the presence of a vegetarian colleague in either case—meat consumption or vegaphobia. This might indicate the importance of so-called strong ties such as family and friends, whereas the impact of weaker social bonds is limited. This should be further explored, both in terms of empirical research and practical implications, since setting vegetarian/vegan food as the baseline in offices and schools could not only benefit the health of those who consume too much meat, it could also further challenge the idea that meat should be considered the norm. It could also overcome a range of food-related barriers among workers and children who may abstain from eating meat because of individual or cultural (religious) reasons [62].

Like all research, this study is not without limitations, which in turn create directions for future research. First, the use of cross-sectional data makes it difficult to substantiate statements about cause and effect. As mentioned previously, the relationship between meat consumption and characteristics of people's social environment entails both voluntarist and structuralist explanations. Social interactions influence dietary choices, yet the latter may also influence social behavior. Especially in the case of the influence of friends, effects can be bidirectional. Vegetarian friends may influence (convinced) meat eaters, and people with similar food preferences may be more likely to become friends. To get a

more refined understanding of the social causes and/or social consequences of dietary choices it is necessary to work with longitudinal data. When these data are missing—which is often the rule, rather than the exception—future research could make use of non-recursive path models. Further, in this study, we extended the meaning of the concept of vegaphobia to also include negative attitudes toward vegetarianism. It may be the case, however, that differences exist between how convinced meat eaters perceive vegans, vegetarians, and flexitarians, not only in the sense that attitudes towards veganism may be more negative, but also that different social factors may play a role in these differences. Finally, in this study the importance of the presence of vegetarians in the social environment was explored by means of conventional attribute data. Next to qualitative research methods, network data and social network analysis (SNA) may be particularly useful to analyze the complex relationships between food preferences and social networks.

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