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Prevalence and Public Perception of Vegetarianism and Veganism: A Comparative Analysis of Nationally Representative Samples from Slovenia and Croatia

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ABSTRACT Although research on vegetarianism and veganism (veg*ism) has expanded significantly, cross-national studies of its general perception remain limited. This study empirically analyses nationally representative samples from Slovenia and Croatia. The results indicate the domi-nance of meat-based culture in both countries, with veg*ism remaining a marginal phenome-non. Public attitudes towards veg*ism are largely negative, although slightly less so in Croatia than in Slovenia. Cluster analysis reveals three distinct groups: those strongly dismissive, those moderately favourable, and an intermediate group that is not persuaded by the argu-ments for giving up animal products but is the least critical of the practice of veganism itself, suggesting that personal rejection of its reasoning does not necessarily equate to rejection of the practice. In Croatia, the dismissive group is notably smaller and the favourable group larg-er than in Slovenia. Women and younger people in both countries have less negative attitudes towards veganism. Education plays a significant role only in Slovenia, where more educated individuals are more receptive to classical arguments for veg*ism and less averse to veganism. Finally, we propose a short set of questions that could be included in one of the large periodic international surveys to allow for a comprehensive assessment of the social and cultural di-mensions of veg*ism and its perception across different societies and cultures.

Key words: vegetarianism, veganism, meat consumption, Slovenia, Croatia, cluster analysis.

1. Introduction

The conscious refusal to eat meat is a centuries-old phenomenon (Savvas, 2024; James, 2020; Stuart, 2008; Spencer, 2002) that has consistently provoked diverse reactions (Salmivaara et al., 2022; De Groeve & Rosenfeld, 2022). Rejection of eating meat has been gaining momentum in modern Western societies (Hanganu-Bresch, 2023; Fox, 2023; Kalte, 2020). Furthermore, the number of plant-based oriented food companies has tripled since 2010 (Abe-Inge et al., 2024), and market-data analysis shows a growing global market for plant-based foods (PR Newswire, 2024). Certain studies have reported that meat-eaters perceived vegetarians and vegans as ethical and environmentally friendly (Bryant, 2019; Judge & Wilson, 2019). Other studies have demonstrated that attitudes towards vegetarianism and veganism are often dismissive (Aloni et al., 2024; Rosenfeld et al., 2023; Ruby et al., 2016) and, at times, even hostile (Aguilera-Carnerero et al., 2021; Markowski & Roxburgh, 2019; Cole & Morgan, 2011). Moreover, studies have documented explicit and implicit biases against vegetarians and vegans (De Groeve et al., 2021). Both seem to be stereotyped as health-conscious and morally motivated (Nezlek et al., 2023). Attitudes towards vegans are often more negative because vegans are perceived as more extreme or morally reprehensible (De Groeve et al., 2021). Public attitudes towards both groups remain predominantly negative to this day (Stanley, 2021; Vandermoere et al., 2019; Bohm et al., 2016).

Vegetarianism and veganism (hereafter we use the term veg*ism to refer to both practices together) are increasingly the subject of in-depth research (see Ruby, 2012). However, more than a decade ago, we noted a lack of reflection on the broader social and cultural contexts of veg*ism (Črnič 2013). We pointed out the surprising fact that despite numerous continuous international surveys (e.g., the International Social Survey Program, the World Values Survey, the European Values Study, and the European Social Survey) comparatively exploring various social and cultural aspects of modern life, none of them specifically address veg*ism. Existing surveys of this topic do not allow for robust comparisons across countries. This highlights a critical need for internationally comparable data on the social dimensions of veg*ism. Therefore, we propose that extending research to the international level is critical to generating much-needed cross-cultural data (ibid.).

In the decade since our proposal, there has been a notable increase in empirical research in this area, with a minor part focusing also on the social and cultural aspects of the phenomenon. However, even within this growing corpus, there are significant gaps – the authors of a recent meta-study (Salehi et al., 2023, p. 17) are noting the apparent dominance of Anglophone countries, "which may lead to a certain bias in the analysis of the phenomenon", and suggesting that future research should address the geographical gap: "we consider it important to broaden the scope of studies to other countries (e.g., Eastern regions or Spanish-speaking countries)". This article attempts to fill part of this gap.

We present a comparative empirical analysis of social dimensions of veg*ism on the representative national samples of Slovenia and Croatia. For a comparison, we have selected two similar societies that have spent a significant part of their history in a common state– first five decades in the Austro-Hungarian monarchy, then most of the 20th century in Yugoslavia. They share a predominantly Catholic cultural pattern and, to some extent, a similar post-socialist experience of recent decades. However,they also differ in that Croatian society is noticeably more traditionalist and,in some respects, more conservative than Slovenian society (Lavrič et al., 2019).

The main purpose of this article is to present an empirical assessment of the extent and characteristics of veg*ans, and, above all, to provide a comprehensive comparative overview of the general perception and attitudes towards veg*ism in the compared countries. This could serve as a basis for further in-depth analysis and theoretical reflections, which cannot be carried out in this article due to space constraints. The initial analysis presented here could also serve as a model for the inclusion of such a thematic block in one of the large regular international survey projects, which would enable a better comparative overview of the phenomenon and its perceptions in different societies and cultures.

2. Conceptual Background

*2.1. Factors Associated with Attitudes towards Veg*ism*

Previous studies have examined the factors associated with the personal decision to adopt a vegetarian or vegan diet. However, noticeably fewer studies have directly addressed the link between individuals' sociodemographic characteristics and their attitudes towards veg*ism. Existing literature demonstrates that attitudes towards these two types of meat-free diet depend on multiple factors.

2.1.1. Sociodemographic Factors

Studies consistently demonstrate that women have more favourable attitudes towards veg*ans than men (Judge & Wilson, 2018; Rosenfeld & Tomiyama, 2021). Studies have also demonstrated that male veg*ans are more likely to be the target of prejudice than female veg*ans – primarily due to the strong traditional association of eating meat with masculinity (Modlińska et al., 2020; Adamczyk et al., 2023). Younger people tend to have more positive attitudes towards veg*ism and are often motivated by moral and environmental concerns (Pribis et al., 2010). They are also more likely to reduce their meat consumption and adopt a more plant-based diet (Vanderlee et al., 2022). Conversely, older people are more likely to disapprove of not eating meat (Vandermoere et al., 2019). On the other hand, some studies have reported that older

people may view certain aspects of veg*ism, such as affordability (Bryant, 2019) and health aspect (Pribis et al., 2010), more positively than younger people.

2.1.2. Educational and Economic Factors

Educational level appears to be an important predictor of attitudes towards veg*ism. Bryant (2019) reported that more highly educated individuals viewed vegetarianism as more affordable and veganism as an ethical choice. Furthermore, research has demonstrated a positive correlation between higher educational attainment and a greater likelihood of adopting a vegetarian diet (Pribis et al., 2010; Pfeiler & Egloff, 2018). A higher level of education is associated with a curiosity to try new types of food and with more advanced knowledge of various food products or types of cuisines (Einhorn, 2021). In contrast, a high-income level does not seem to be consistently related to positive attitudes towards veg*ism – individuals with higher income may view veganism as less appealing dietary choice (Bryant, 2019). Another study (Allès et al., 2017) suggests that French veg*ans are more likely to come from lower-income groups.

2.2. Vegetarianism and Veganism in Croatia and Slovenia

Due to the lack of reliable empirical data, we can only speculate about the exact extent of veg*ism in Croatia and Slovenia. While there are descriptions of the beginnings of the organised vegetarian movement in Croatia in the 1920s (Belošević, 2006 and 2021), we have not found reliable data on the proportion of individuals who do not eat meat and/or other animal products. A few non-scientific sources claim that slightly less than 4 % of Croatians follow a veg*an diet (Jokič-Vaislay, 2012; Total Croatia, 2023).

More data is available for Slovenia. The longitudinal research project Slovenian Public Opinion (SJM) has occasionally asked the question, "How many times a week do you eat meat?" In 1994, 1.2% of respondents answered "never"; in 1996, this figure was 1.4%, and in 2001, it was 2.9% (unfortunately, this question has not been included in surveys since then). Estimates of the number of veg*ans can be found in the results of two other empirical studies (which were conducted on a representative sample of Slovenian adults aged between 18 and 65, as were the SJM studies). A study of eating habits from a health perspective found 0.5% of "strict" vegetarians and 2.5% of lacto-ovo vegetarians, as well as 3% of macrobiotics (Koch 1997). A study of lifestyles in a media society reveals 3% vegetarians and 2% macrobiotics (Tivadar 2002). Our research on representative samples in Ljubljana and Maribor (Črnič 2013) showed that veg*ism is most widespread among the middle social classes, who are also the least opposed to it (especially the more educated). We estimated that up to 3% of the popu-

lation are veg*ans, a group consisting predominantly of highly educated middle-aged women. Another study found that 1.6% of adults and 1% of older people reported not eating red meat or poultry (Gregorič et al., 2022).

3. Methodology

3.1. Data and Sample

Following our proposal in 2013 to construct and include a block of thematic questions on veg*ism in one of the international comparative surveys on nationally representative samples (Črnič 2013), we developed a short set of four thematically focused questions. In 2019, this was included in the Slovenian and two years later in the Croatian implementation of the International Social Survey Program (as a one-time only occurrence). The ISSP 2018 - Religion was conducted in Slovenia as part of the Slovenian Public Opinion Survey 2019, with a nationally representative sample of 1,079 respondents aged between 18 and 89 (Hafner Fink et al., 2021). In Croatia, the block of questions was included in the survey ISSP 2020 - Environment, which was conducted in the summer of 2021 on a nationally representative sample of 1,000 adult respondents (ISSP Research Group, 2023). Both samples are based on a multistage, stratified probability sampling from the Central Register of Population. Not all the variables that we needed for the current study were entered into the Croatian ISSP Environment database, where the questions on veg*ism were located. For this reason, we merged the Croatian Environment database with the Integrated Environment database (ibid.), following the respondents' identification numbers. Only those variables that were identical between the Slovenian and Croatian databases were used in the study, which allowed us to make statistically valid comparisons.

3.2. Measurement

We examined several factors associated with meat, fish and dairy consumption and perceptions and attitudes towards veg*ism in the selected countries.

2.2.1. Outcome variables

The frequency of consumption of three types of food, i.e. meat, fish and dairy was measured by asking respondents to choose one of the following options: 1 = "daily", 2 = "several times a week", 3 = "frequently (1-2x per week)", 4 = "occasionally (less than 1x per week)", 5 = "only exceptionally (1-3x per year)" or 6 = "never". Respondents who selected one of the last four options ("frequently", "occasionally", "only exceptionally", or "never") were asked an additional question about the reasons for avoiding meat, fish or milk. Respondents needed to choose one of the six options: "I don't like

the taste", "It's bad for my health / My doctor told me to"[1], "It's linked to overuse of natural resources, harms the environment/nature", "It's linked to unnecessary suffering / exploitation of animals", "It's forbidden by my religious beliefs / it's bad for my spirituality" or "It's too expensive for me".

The prevalence of veg*ism was also measured by asking respondents if they would describe themselves as either vegetarian or vegan (1 = yes, 2 = no).

We measured the attitude of the Slovenian and Croatian population towards veg*ism using six statements (specifically designed for this purpose), which respondents rated on a five-point scale (1 = "strongly disagree" to 5 = "strongly agree"[2]):

- "People who do not eat meat and meat products are healthier."
- "Avoiding animal foods is essential for effective environmental protection."
- "I find it ethically questionable to eat meat."
- "Eating any meat products is simply repugnant to me."
- "People who eat neither meat, nor fish, nor dairy products, and who refuse to use animal products, are just too radical."
- "Parents who do not allow their underage children to eat meat, fish or dairy foods should be dealt with by social services and the children should be protected."

The first three statements measure attitudes towards the most common arguments or dominant motives for veg*ism, i.e. health, ecological and ethical motive. The fourth statement measures the prevalence of a general and comprehensive rejection of meat as a dietary staple. The last two statements, though, look at a different side of the perception of veg*ism: how radical the general population perceives the decision to go vegan, and whether children should be protected from an exclusively vegan diet.

2.2.2. Predictor Variables

We included several sociodemographic and socioeconomic variables in our analyses: gender (1 = male, 2 = female); age (1 = 30 years or less, 2 = 31 to 45 years, 3 = 46 to 60 years, 4 = 61 years or more); educational level[3] (1 = primary education or less, 2 = lower or secondary vocational education, 3 = general secondary education, 4 = higher vocational or general education, 5 = university, 6 = specialization, Master of Science, Ph.D.); place of residence (1 = large city, 2 = outskirts of a large city, 3 = smaller town,

[1] In the analyses we combined these two answers into one category.
[2] In the original questionnaire, the scales were reversed, with 1 indicating "strongly agree" and 5 "strongly disagree". In the analysis, however, all 6 of the original Likert scales were recoded so that higher values indicate greater support for veg*ism.
[3] Educational level was recoded from the original 12 possible answers into 6 categories for the purpose of statistical analysis.

4 = rural place, village[4]), self-identification on the social scale[5] (1 = below average, 2 = average, 3 = above average) and monthly household income as a continuous (scale) variable[6].

3.3. Plan of Analysis

We performed descriptive statistics on the prevalence of veg*ism and different social dimensions of veg*ism. Second, we performed Spearman's bivariate correlation analysis between demographic variables and outcome variables. Third, we carried out a two-step cluster analysis where we used the set of six statements about veg*ism to group the respondents into distinct groups. The clustering was carried out in two steps - in the first step, we applied hierarchical clustering using Ward's method and the square of the Euclidean distance, thus obtaining a graphical representation in the form of a dendrogram. In the next step, we applied the method of leaders (K-means) to optimise the ranking obtained by hierarchical clustering. In doing so, we used only complete samples - respondents who gave answers for all the statements used for clustering (listwise deletion). The cluster method revealed three main groups of attitudes towards veg*ism, which were then used in additional analyses. Finally, we performed a multinomial regression analysis using attitudes towards veganism as the dependent variable and the predictors described above as independent variables. For the purpose of regression analysis, some of the independent variables were further recoded. Educational level was recoded into four categories (1 = primary education or less, 2 = secondary education, 3 = higher vocational or general education, 4 = university education or higher), and place of residence was recoded into three categories (1 = large city and its outskirts, 2 = smaller town, 3 = rural place, village).

4. Results

4.1. Dietary Reduction of Animal Products: Patterns and Motivations

The data in Table 1 show that the typical diet in both countries is heavily based on meat, even more so in Croatia than in Slovenia. Most respondents consume meat and meat products several times a week, and about a quarter do so daily. Milk and dairy

[4] In the Slovenian sample, the categories 'rural place' and 'isolated house in a rural area/on the farm' have been merged together into one category to match the characteristics of the Croatian variable for place of residence.

[5] The variable for self-identification on the social scale was recoded from the original 10-point Likert scale into 3 categories for the purpose of statistical analysis.

[6] In the Slovenian sample, income was measured in euros, while in the Croatian sample it was measured in kunas - their former monetary currency.

products are consumed even more frequently, while fish is eaten much less frequently. The proportion of respondents who strictly avoid meat and meat products is the same in both countries at just over 2%. Slovenians are significantly more likely to avoid milk and dairy products while, surprisingly (given the long coastline), slightly more Croatians avoid fish.

Table 1.
Meat, fish and dairy consumption (in %)

	Meat and meat products		Fish		Milk and/or dairy	
	Slo	Cro	Slo	Cro	Slo	Cro
Daily	24.1	25.8	1.2	1.4	50.3	50.3
Several times a week	54.7	60.3	9.2	16.8	27.9	32.9
Frequently (1x-2x per week)	14.8	9.9	34.3	33.3	10.8	8.5
Occasionally (less than 1x per week)	4.4	1.9	40.5	31.4	5.9	5.3
Only exceptionally (1x-3x per year)	0.7	0.7	10.9	12.5	2.1	0.9
Never	1.4	1.4	3.9	4.6	3	2.1

We used the question on the frequency of meat, fish and dairy consumption to classify veg*ans into four categories:

1. vegans, who consume neither meat, fish nor dairy products;
2. lacto-vegetarians, who do not consume fish in addition to meat, but do consume milk and dairy products;
3. partial vegetarians, who do not consume meat (answered 'never' or 'only occasionally'), but occasionally or regularly consume fish and dairy products;
4. flexitarians (see Kamin et al., 2024; Dagevos, 2021; Kemper & White, 2020; Rosenfeld et al., 2020), who eat both meat and fish, but not more than twice a week.

Our sample included 7 vegans in each country (0.6% of the Slovenian sample and 0.7% of the Croatian sample), 10 lacto-vegetarians (0.9%) in Slovenia and 8 (0.8%) in Croatia, 5 partial vegetarians (0.5%) in Slovenia and 12 (1.2%) in Croatia, and 195 flexitarians (18.1%) in Slovenia and 114 (11.4%) in Croatia. Although the proportions are too small to make statistically reliable generalizations, they suggest that the proportions of veg*ans in the two countries are quite similar and relatively low.

We have also used another way to measure this phenomenon - in addition to measuring the frequency of (non)consumption of meat, fish and/or dairy products, we can approach this directly by asking respondents whether they declare themselves vegetarian or vegan. This second method yielded 20 (1.9%) vegetarians and four (0.4%) vegans[7] in Slovenia and 16 (1.6%) vegetarians and 10 (1%) vegans in Croatia. As expected, these are very low proportions of the total populations, which are similar

[7] One Slovenian respondent declares to be both vegetarian and vegan.

for both measurement methods - so further analyses are performed on the combined category (n = 23 in Slovenia and n = 26 in Croatia) of self-reported vegetarians and vegans. It should be noted that due to the low number of respondents, the analyses are not statistically reliable, and therefore the results presented in this section are mainly informative and indicative; caution should be exercised in generalising from them.

Table 2 shows that there are more women among self-reported veg*ans in Croatia (but not in Slovenia), which is in line with some other studies (Ruby, 2012; Salehi et al., 2023; Pfeiler and Egloff, 2018). Veg*ans in Croatia also appear to be significantly younger compared to the Slovenian sample. Nevertheless, the Slovenian sample also has a significantly higher proportion of veg*ans under 30 and a lower proportion of veg*ans over 61. In Croatia, veg*ans have predominantly completed secondary education, whereas in Slovenia they are more evenly distributed in terms of education. In Croatia, they are more concentrated in larger cities, whereas in Slovenia, they are concentrated in smaller cities.

Table 2.
Demographic structure of veg*ans and the rest of population (in %)

	Veg*ans		The rest of population	
	Slo	Cro	Slo	Cro
Gender				
Male	47.8	27.3	48.9	45.2
Female	52.2	72.7	51.1	54.8
Age				
Up to 30 years	30.4	38.1	15.3	33.1
31-45 years	21.7	33.3	22.8	28.0
46-60 years	30.4	19.0	24.1	24.9
61 years or more	17.4	9.5	37.7	14.1
Education				
Primary education or less	8.7	0.0	16.9	7.3
Lower or secondary vocational education	13	13.6	21.7	22.2
General secondary education	30.4	68.2	31	47.0
Higher vocational or general education	17.4	4.5	14.1	10.6
University	26.1	9.1	12.7	11.3
specialization, Master of Science, Ph.D.	4.3	4.5	3.5	1.5
Place of residence				
Large city	21.7	40.9	14.2	27.2
Outskirts of a large city	4.3	18.2	7.9	10.5
Smaller town	43.5	22.7	26.1	25.6
Rural place, village	30.4	18.2	51.8	36.6

The next step was to measure the reasons for not eating meat, fish or milk. Personal motives for abstaining were measured separately for self-described veg*ans and flexitarians, who eat mostly plant-based foods and only occasionally meat and fish. The main motives for avoiding certain foods were grouped into 6 categories: taste, health, ecology, ethics, religion and cost (see chapter 3 Methodology).

Table 3 shows that the most frequent reason for not eating meat and milk products among flexitarians is, in both countries, related to health (in Slovenia, this motive is equal to the taste motive), while the motive for avoiding fish is related to taste in Slovenia and to cost in Croatia. For veg*ans, the motives are markedly different, and more heterogeneous. Among them, the ethical motive for giving up meat dominates in Slovenia, which is only third in Croatia (after the health and taste motive). Among the Slovenian veg*ans, the health motive presents the dominant motive for giving up milk, while in Croatia the health and taste motive present the dominant motive. For fish, the ethical motive is clearly dominant among veg*ans in Slovenia. In Croatia, eating fish is avoided primarily for ecological reasons. The least common motive for avoiding all three food categories among both flexitarians and veg*ans is religious. Among flexitarians, the cost motive is more prevalent (while it is not at all mentioned among Slovenian veg*ans) and is the most prevalent motive among Croatian flexitarians for avoiding fish. The ethical motive is generally the most prevalent motive for avoiding meat and fish among Slovenian veg*ans. The relatively low incidence of the ecological motive among veg*ans might come as a slight surprise, as environmental awareness is very present among young people in particular - part of the reason for this could be the composition of the survey samples themselves, which do not include respondents under 18 years of age.

Table 3.
Motives for avoiding particular foods (in %)

	Flexitarians						Veg*ans					
	Meat		Fish		Milk & dairy		Meat		Fish		Milk & dairy	
	Slo	Cro	Slo	Cro	Slo	Cro	Slo	Cro	Slo	Cro	Slo	Cro
Taste	31.5	16.7	45.4	22.8	37.5	11.9	4.8	31.6	10.5	18.8	14.3	30.8
Health	31.5	32.5	5.1	12.3	55	50	33.3	36.8	10.5	18.8	57.2	30.8
Ecology	8.4	17.5	7.7	14	0	16.7	14.3	5.3	21.1	25	0	15.4
Ethics	8.4	9.6	3.8	14.9	2.5	11.9	42.9	21.1	52.6	18.8	28.6	23.1
Religion	0	1.8	0	0	0	2.4	4.8	0	5.3	0	0	0
Costs	20.3	21.9	36.9	36	5	7.1	0	5.3	0	18.8	0	0

*4.2. General perceptions and attitudes towards veg*ism*

In the second part of our analysis, we focused on the perception of veg*ism among the Slovenian and Croatian populations. As already noted, the growing body of research on veg*ism (see Ruby, 2012; Salehi et al., 2023) still somewhat neglects its perception among the general public. The following part of our study, therefore addresses this notable gap in existing literature.

Table 4 shows Spearman's bivariate associations between attitudes towards veg*ism and different demographic variables. In Slovenia, gender is associated with only two aspects of attitudes towards veganism: women, compared to men, perceive the decision to go vegan as less radical and are less likely to agree that children should be protected from vegan parents. In Croatia, women are more likely than men to agree with the argument for protecting the environment, view meat consumption as ethically controversial and see the decision to go vegan as less radical.

Age is associated with two aspects of attitudes towards veganism in Slovenia: older people are more likely to perceive veganism as something radical and more likely to agree that children should be protected from an exclusively vegan diet. In Croatia, younger people are more supportive of the environmental argument for giving up meat and perceive veganism as less radical.

In the Slovenian sample, education is associated with most attitudes towards veg*ism: more educated individuals are more likely to support the environmental argument for giving up meat, perceive meat consumption as more ethically controversial, perceive veganism as less radical, and are less likely to agree that children should be protected from vegan diets. Among the Croatian population, the level of education is only related to one aspect, namely that less educated people are more likely to feel disgust towards meat.

In Slovenia, the social status of respondents is associated with two aspects of their attitudes towards veg*ism. Those who place themselves higher on the social scale are more supportive of the health argument for giving up meat. Similarly, in the Croatian sample, people higher on the social scale are more supportive of the health argument against meat consumption. At the same time, they are also more supportive of the environmental argument against meat consumption and perceive meat as more ethically controversial. Furthermore, in Slovenia, average monthly household income is associated with almost all attitudes towards veg*ism. Individuals from households with higher income express a higher support of the health and environmental argument and perceive meat as more ethically problematic. They are also less likely to perceive veganism as a radical choice and less likely to agree that children have to be protected from a vegan diet. In the Croatian sample, average household income is associated only with repugnance towards meat. Surprisingly, individuals from households with a lower income feel greater aversion towards meat.

Table 4.
Bivariate associations between attitudes towards veg*ism and demographic variables here

	Healthier		Environmental protection		Ethically problematic		Repugnance to meat		Too radical		Child protection	
	Slo	**Cro**	**Slo**	**Cro**	**Slo**	**Cro**	**Slo**	**Cro**	**Slo**	**Cro**	**Slo**	**Cro**
Gender	0.06	0.06	0.00	0.08*	0.05	0.10**	0.05	0.05	-0.10**	-0.10**	-0.08**	-0.04
Age	-0.04	-0.06	0.00	-0.08**	0.01	-0.03	-0.01	0.01	0.22**	0.07*	0.18**	0.03
Education	0.06	-0.02	0.14**	-0.04	0.13**	0.01	0.05	-0.06*	-0.10**	0.01	-0.14**	-0.04
Self-identification on the social scale	0.07*	0.07*	0.01	0.06	0.02	0.08**	-0.06	-0.01	-0.05	-0.04	-0.04	0.00
Household income	0.11**	-0.15	0.09*	0.00	0.09*	-0.02	0.04	-0.11**	-0.09*	-0.02	-0.11*	0.01
Place of residence	-0.05	0.02	-0.15**	0.10**	-0.10**	0.05	-0.10**	0.07*	0.03	0.04	0.05	0.07*

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

Table 5.
Attitudes towards veg*ism based on cluster analysis

	Slovenia				**Croatia**			
	Group 1 (n=461)	Group 2 (n= 202)	Group 3 (n=315)		Group 1 (n = 363)	Group 2 (n = 363)	Group 3 (n =274)	
	Dismissive	**Favourable**	**Tolerant**	**F(df), p***	**Dismissive**	**Favourable**	**Tolerant**	**F(df), p***
	M	M	M		M	M		
Healthier	1.91	3.2	2.2	158.506 (2;485.3), <0.001	1.64	3.23	2.05	340.012(2;627.23), <0.001
Environmental protection	1.8	3.36	1.9	278.389 (2;483.196), <0.001	1.55	3.15	1.93	369.574(2;626.267), <0.001
Ethically problematic	1.66	3.04	1.79	197.965 (2;465.215), <0.001	1.64	2.95	1.87	255.751(2;638.165), <0.001
Repugnance to meat	1.39	2.4	1.58	98.321 (2;443.704), <0.001	2.24	3.06	1.89	154.801 (2;656.880), <0.001
Too radical	4.47	3.24	3.18	279.809 (2;415.583), <0.001	4.34	3.23	2.26	495.507 (2;608.822), <0.001
Child protection	4.41	3.47	2.72	406.837 (2;422.627), <0.001	3.94	3.02	2.24	218.869 (2;631.241), <0.001

Note. *Welch's ANOVA

Among the Slovenian population, living in a more urbanised environment is associated with greater support for the environmental argument against meat consumption, greater perception of meat as ethically controversial and greater revulsion towards meat. In Croatia, on the contrary, living in a less urbanised environment is associated with greater support for the environmental argument and greater aversion towards meat, but it is also associated with greater agreement on the need to protect children from an exclusively vegan diet.

In summary, in both countries, women and younger people show less negative attitudes towards veganism. Education seems to be an important factor only in Slovenia, where the more educated are more accepting of the classical arguments for veg*ism and are less averse to veganism. As regards to the (self-perceived) social position and place of residence of the respondents, there seem to be as many differences as similarities between the two societies compared.

3.2.1. Cluster analysis

Based on cluster analysis, the respondents from both countries can be classified into three different groups based on their attitudes towards veg*ism. Table 5 shows the mean values of agreement with the statements used for clustering.

The first group includes those respondents who express the most negative attitudes towards veg*ism. Compared to the other two groups, they are the least convinced by the arguments for giving up meat consumption, by far the most likely to see veganism as radical and therefore by far the most likely to want to protect children from it (Table 5). This group, which includes almost half of Slovenian and a good third of Croatian respondents, can be described as strongly dismissive of veg*ism.

The second group consists of respondents who appear to be slightly in favour of veg*ism. On average, they slightly approve of the three main arguments for veg*ism: environmental, health and ethical. They are more repulsed than others by the consumption of meat products. Nevertheless, on average, they consider the decision to go vegan to be moderately radical. This group, which accounted for a fifth of respondents in Slovenia and a good third in Croatia, will be referred to as 'favourable' in the following, given the generally very unfavourable attitudes of the samples towards veg*ism.

The third group is more mixed. It includes respondents who are generally unconvinced by the arguments for rejecting meat: they are somewhere between the dismissive and the favourable groups in terms of the impact of eating animal foods on health, ecology and ethics (although closer to the former in the Slovenian sample and the latter in the Croatian sample). At the same time, they do not consider veganism to be overly radical; they are the least critical of it compared to the other two groups.

In short, these are people who are not convinced by the arguments for veg*ism, but at the same time find these practices less radical, accepting them to some extent. So, we could say that this is a group of more moderate respondents, and we have called it a 'tolerant' group.

A glance at the three groups (Table 5) shows that they differ in size in the two countries - in Croatia, there are significantly fewer rejecters and significantly more (moderate) supporters of veg*ism. This, considering the previous analyses, further suggests that in general the Croatian public is less dismissive of veg*ism than the Slovenian public. At the same time, the results of the cluster analysis show a more nuanced general attitude towards veg*ism that goes beyond the binary distinction between sympathy and rejection.

For a deeper understanding of the groups, we analysed their composition in terms of basic demographic variables.

Table 6.
Demographic structure of the groups (in %)

	Slovenia			Croatia		
	Dismissive	**Favourable**	**Tolerant**	**Dismissive**	**Favourable**	**Tolerant**
	%	%	%	%	%	%
Gender						
Male	54.2	48.5	43.8	49	43	41.6
Female	45.8	51.5	56.2	51	57	58.4
Age						
Up to 30	13.7	19.8	18.7	28.2	37.2	34.6
31-45	18.2	22.3	30.5	28.7	25	31.3
46-60	24.1	22.8	23.8	27.6	22.8	23.5
61 and over	44	35.1	27	15.5	15	10.7
Education						
Primary education or less	19.3	11.9	13	5.8	9.7	5.6
Lower or secondary vocational education	23.7	13.4	20	22.4	21.9	21.6
General secondary education	27.2	36.1	34.3	47.6	43.9	52
Higher vocational or general education	13.9	17.8	15.9	9.1	13.9	7.8
University	11.5	16.8	14	13.3	8.9	11.5
specialization, Master of Science, Ph.D.	4.3	4	2.9	1.7	1.7	1.5
Place of residence						
Large city	13.9	18.8	12.4	31.4	23.5	27.7
Outskirts of a large city	8.5	9.4	6.3	9.9	7.7	15.7
Smaller town	23.5	33.2	27.6	22.9	27.9	25.9
Rural place, village	54.2	38.6	53.7	35.8	40.9	30.7
Self-identification on the social scale						
Below average	14.8	14.6	13.3	16.5	11.9	12.6
On average	54.7	52.8	55	48.2	49.4	51.7
Above average	30.5	32.7	31.7	35.3	38.7	35.6

When analysing the demographic structure of the groups (Table 6), the Chi-square test for the Slovenian sample shows statistically significant differences between the groups in terms of gender ($\chi2 = 8.270$, df = 2, p = 0.016), age ($\chi2 = 31.875$, df = 6, p < 0.001), education ($\chi2 = 25.136$, df = 10, p = 0.005) and place of residence ($\chi2 = 18.191$, df = 8, p = 0.02). However, there were no statistically significant differences between the groups in terms of self-perceived social ranking ($\chi2 = 0.680$, df = 4, p = 0.954).

In Slovenia, there are more men than women in the very dismissive group. Most of this group is older, with almost half aged over 61. This group is characterised by a lower level of education than the others: it has the highest proportion of respondents with less than high school education (43%) and the lowest proportion with more than high school education (30%).

In the slightly favourable group, the ratio of men to women is more similar to the population as a whole, with a slight female predominance. There is a noticeably higher proportion of people under 30 and a higher proportion of more educated people: 39% with at least a higher vocational or general education.

The tolerant group is more clearly dominated by women. Compared to the population as a whole, there are significantly more respondents in the early middle age group (31-45 years) and by far the fewest over 60 years of age. In terms of education, this group generally falls somewhere between the other two groups and is most similar to the population as a whole.

Based on these results, we can conclude that in Slovenia, men are noticeably more dismissive, women are more tolerant than average, and slightly more favourable to veg*ism. Young people are less dismissive, the early middle-aged generation is more tolerant, while older people are markedly more dismissive and less tolerant. The least educated are noticeably more dismissive, the more educated are more favourable and noticeably less dismissive.

Unlike in Slovenia, in Croatia, the Chi-square test shows statistically significant differences between the three groups only with regard to place of residence ($\chi2 = 20.051$, df = 6, p = 0.003). Those favourable to veg*ism are more likely to live in rural areas and villages, while in Slovenia they are more likely to live in cities and towns (Table 6). The Chi-square test does not show statistically significant differences between the groups in terms of gender ($\chi2 = 4.253$, df =2, p = 0.119), age ($\chi2 = 11.824$, df = 6, p = 0.066), education ($\chi2 = 16.980$, df = 10, p = 0.075) or self-perceived social ranking ($\chi2 = 4.184$, df = 4, p = 0.382). The absence of statistically significant differences between groups according to demographic parameters shows that in Croatia attitudes towards veg*ism are significantly less influenced by socio-demographic factors.

We conducted a multinomial regression analysis to examine the effect of various sociodemographic and socioeconomic variables on group membership based on attitudes toward veg*ism. The dependent variable was a cluster variable representing groups based on attitudes toward veg*ism. The group of individuals with dismissive attitudes served as the reference category. The results of the multinomial regression analysis (Table 7) for Slovenia show that males have 34 % lower odds of being tolerant towards veg*ism compared to females (OR = 0,66). Individuals aged 30 years and younger have 107 % higher odds of being tolerant of veg*ism compared to the oldest age group (OR = 2,07). Similarly, those aged 31-34 years have 154 % higher odds of being tolerant of veg*ism compared to the oldest age group (OR = 2,54). The youngest ones (under 30 years) have 71 % higher odds of being favourable to veganism compared to the oldest age group (OR = 1,71). Individuals from larger cities and outskirts have 67 % higher odds of being favourable towards veg*ism than those from rural areas (OR = 1,67). Similarly, individuals from smaller towns have 89 % higher odds of being favourable towards veg*ism compared to those from rural areas (OR = 1,89).

The results for the Croatian sample show that males have 29 % lower odds of being among those who are tolerant of veg*ism compared to females (OR = 0,71). Furthermore, being under 30 years is associated with a 87 % higher odds of being in the tolerant group compared to the oldest age group (OR = 1,87). Interestingly, those with primary education have 147 % higher odds of being favourable towards veg*ism compared to the most highly educated (OR = 2,47). Individuals living in a large city or in its outskirts have 30 % lower odds of being favourable towards veg*ism compared to those from rural areas (OR = 0,70). Finally, those who classify themselves below average on the social scale have 41 % lower odds of being favourable towards veg*ism compared to those who classify themselves above average on the social scale (OR = 0,59).

Table 7.
Result from multinomial regression analysis with attitudes towards veg*ism as a dependent variable

	Slovenia						Croatia					
	Tolerant			Favourable			Tolerant			Favourable		
	β	OR	95 % CI	β	OR	95 % CI	β	OR	95 % CI	β	OR	95 % CI
Gender[8]												
Male	-0.41**	0.66	0.49 - 0.89	-0.25	0.78	0.55 - 1.10	-0.35*	0.71	0.51 - 0.98	-0.29	0.75	0.55 - 1.02
Age[9]												
Up to 30	0.73**	2.07	1.32 - 3.26	0.54*	1.71	1.04 - 2.81	0.63*	1.87	1.04 - 3.35	0.23	1.26	0.77 - 2.07
31 - 45	0.93**	2.54	1.69 - 3.81	0.23	1.26	0.78 - 2.03	0.51	1.66	0.92 - 2.98	- 0.10	0.91	0.55 - 1.51
46 - 60	0.36	1.43	0.96 - 2.14	0.13	1.14	0.73 - 1.79	0.23	1.26	0.70 - 2.27	- 0.17	0.84	0.51 - 1.40
Education[10]												
Primary education or less	-0.28	0.76	0.43 - 1.33	-0.63	0.53	0.28 - 1.01	0.43	1.54	0.65 - 3.66	0.91*	2.47	1.18 - 5.21
Secondary education	0.08	1.08	0.69 - 1.68	-0.25	0.78	0.48 - 1.27	0.27	1.31	0.80 - 2.15	0.26	1.30	0.81 - 2.08
Higher vocational or general education	-0.05	0.95	0.56 - 1.62	-0.03	0.97	0.55 - 1.72	0.01	1.01	0.49 - 2.08	0.59	1.81	0.96 - 3.41
Place of residence[11]												
Large city and its outskirts	-0.19	0.83	0.56 - 1.23	0.52*	1.67	1.09 - 2.56	0.18	1.19	0.81 - 1.75	- 0.36*	0.70	0.49 - 1.00
Smaller town	0.13	1.14	0.80 - 1.63	0.64**	1.89	1.26 - 2.83	0.28	1.33	0.86 - 2.05	0.10	1.10	0.75 - 1.63
Self-identification on the social scale[12]												
Below average	0.03	1.03	0.63 - 1.70	0.21	1.23	0.70 - 2.16	-0.22	0.80	0.47 - 1.36	- 0.53*	0.59	0.35 - 0.97
On average	0.04	1.05	0.74 - 1.48	0.08	1.08	0.73 - 1.61	0.04	1.04	0.73 - 1.50	- 0.06	0.94	0.67 - 1.32

Note. OR = odds ratios, CI = confidence interval, ** $p < 0.01$; * $p < 0.05$

[8] Reference group = Female
[9] Reference group = 61 and over
[10] Reference group = University education or higher
[11] Reference group = Rural place, village
[12] Reference group = Above average

5. Discussion and conclusions

5.1. Main features of vegetarianism and veganism in Slovenia and Croatia

Our analyses demonstrate that meat-based culture is prevalent in both environments, with most respondents regularly eating meat several times a week, if not daily. Veg*ism is, as expected, rather marginal phenomena, the extent of which could be roughly estimated at around 3% of veg*ans in both countries.

The findings suggest that the population of veg*ans in Croatia may be younger, probably come more from urban backgrounds and may be more female dominated than in Slovenia. There seems to be a difference between veg*ans, on the one hand, and flexitarians, on the other, in terms of motives for abstaining from animal products: while health motives dominate for flexitarians in both countries, veg*ans tend to have more ethical (especially in Slovenia) and environmental motives. This is in line with other research in the field (Dhont et al., 2024; Kamin et al., 2024; Dagevos, 2021; Kemper & White, 2020; Rosenfeld et al., 2020; Rosenfeld & Burrow, 2017).

Despite thorough in-depth analysis, it would be difficult to draw any further conclusions with sufficient certainty, as the small number of veg*ans identified in both samples makes the analyses statistically insufficiently reliable.

5.2. Perception of vegetarianism and veganism in Slovenia and Croatia

The above analysis confirms that the general rejection of intentional avoidance of animal foods, as found in other studies (Aavik, 2021; MacInnis & Hodson, 2017; Edwards, 2013; Sneijder & Te Molder, 2009), also prevails in Slovenia and Croatia. The general population in both countries is predominantly sceptical about veg*ism, is not convinced by the arguments for it (unlike in some other countries, see e.g. Bryant, 2019), and is largely dismissive of the practices themselves. There are, however, notable differences between the two countries.

The Croatian public generally rejects the classical veg*an motives (health, ecology and ethics) a little less, the ethical motive in particular seems to be more accepted than in Slovenia. Meat is repulsive to a slightly larger proportion of Croatians, who seem to be generally less critical of vegan practices. Women and younger people in both countries show less negative attitudes towards veganism. Education seems to be an important factor only in Slovenia, where the more educated are more accepting of the classical arguments for veg*ism and are less averse to veganism. These correlations with gender, age and education are to be expected according to the findings of other studies (Rosenfeld & Tomiyama, 2021; Modlińska et al., 2020; Vandermoere et al., 2019; Judge & Wilson, 2019; Pribis et al., 2010).

Cluster analysis provides a more detailed picture of the generally negative attitude of Slovenian and Croatian society towards veg*ism. Three disjunctive groups emerge: those strongly dismissive of veg*ism, those slightly in favour, and those somewhere in between – although they are not at all convinced by the arguments for giving up animal foods, they are the least critical of the practice of veganism.

In Croatia, the dismissive group is noticeably smaller and the favourable group larger than in Slovenia, further confirming the finding that in general the Croatian public seem to be less dismissive of veg*ism than the Slovenian public. This is somewhat surprising, since Croatian society, as already mentioned in the introduction, is generally more traditional than Slovenian society (Lavrič et al., 2019).

In Slovenia, the dismissive group has a higher proportion of men, older and less educated. This finding aligns with the historical associations of meat with strength, power and a higher social status (Vandermoere, 2019; Chan & Zlatevska, 2019). The reasons for this being less visible in the Croatian sample will have to be the subject of further analysis.

The favourable group in Slovenia has a higher-than-average proportion of younger and better-educated people, and the tolerant group has a higher proportion of women and respondents in early middle age. This also largely confirms the above-mentioned correlation of gender, age and education with attitudes towards veg*ism.

The attitudes towards veg*ism in Croatia seem to be significantly less influenced by socio-demographic factors than in Slovenia. In Croatia, analyses show statistical differences only in terms of place of residence: those who are slightly more in favour of veg*ism are (somewhat surprisingly) more likely to live in rural areas and villages, while in Slovenia they are more likely to live in cities and towns. The hypothesis that urban dwellers are more, and rural dwellers are less likely to favour veg*ism (because cities tend to have more diverse populations and greater exposure to different cultures and lifestyles, which often leads to greater acceptance of veg*ism) is only confirmed in the Slovenian sample, while the opposite appears to be true in Croatia.

Due to space limitations, we are unable to offer a broader theoretical interpretation of the findings or a more in-depth exploration of the conceptual factors underlying the differences between the two national samples. The main purpose of this article is to present preliminary comparative statistics, which are a prerequisite for further, more in-depth reflections.

5.3. Limitations

The current study has different limitations that need to be addressed. Already in a study from over a decade ago, we noted that "the quantitative surveys on the representative samples are often not the most suitable methodological tool for the study of veg*an populations since they are usually simply too small", so we "have to be well aware of the problem of representativity" (Črnič 2013: 1119). Some other studies (e.g. Hagmann et al., 2019; Pfeiler & Egloff, 2018) do attempt a quantitative approach for studying the characteristics of veg*ism, but they are conducted on nationally representative samples that are much larger than ours (the aforementioned studies had 4213 and 5125 respondents respectively, which is 4-5 times more than ours). The first part of our findings can therefore serve as an informed estimate, but cannot be reliably generalised to entire populations. Nevertheless, our results are useful as a rough guide, as we do not have other indicators of this kind.

The analysis of the general population's perceptions and attitudes towards veg*ism are statistically much more reliable. The limitation of this second part of our research is that, despite our best efforts, we were not able to place the block of questions on veg*ism in the same ISSP research module in both countries. Consequently, we had a very limited set of comparable variables for analysis, so we couldn't measure the different dimensions of the perception of veg*ism (such as respondents' attitudes towards society and their political self-identification,[13] settlement size, different dimensions of religiosity, etc.) as comprehensively as we would like.

In addition, the data for the Slovenian and Croatian samples were collected almost two years apart. We used data from a cross-sectional survey, which means we cannot generalise about cause-and-effect relationships. Similarly, the findings cannot be reliably generalised beyond the populations of Slovenia and Croatia.

5.4. Relevance and recommendations for further research

The above presented assessment of the extent but also of the elementary internal structure of the phenomenon of veg*ism can be useful and welcome, despite the limited statistical reliability, as there is still a serious deficit of empirical data to reliably de-

[13] For example, in the Slovenian sample only, we measured attitudes towards society through 1) expressed levels of authoritarianism (in terms of expressed support for either democracy or a strong leader), 2) fear of refugees as a threat to our way of life, 3) perception and evaluation of the promotion of intolerance towards certain groups, and 4) overall placement on the conservative-liberal axis (through measures of attitudes towards homosexuality, abortion, euthanasia and death penalty). In this way we tested some other empirical findings (Salehi et al., 2023; MacInnis & Hodson 2017; Chin et al., 2002) and confirmed that those who are highly critical of veg*ism are also in Slovenia on average more conservative and authoritarian and those who are favourable to veg*ism are much more liberal (see Črnič & Brečko 2023).

termine this across countries. It is true, however, that more detailed information on veg*ism could be more reliably researched in a quantitative way with focused samples of exclusively veg*ans, and in a qualitative way with interviews, focus groups, biographies, etc. However, to understand the big picture a more comprehensive design of quantitative and qualitative research on social aspects of veg*ism and responses to it should certainly include also comparative surveys of nationally representative samples.

The present study could be used as an example to develop a thematic block of questions that should usefully be included in the same international survey (i.e. the same questionnaire, allowing comparative analysis of correlations with many other variables), to be repeated periodically. That this can be an ambitious proposition in practice is something we have seen for ourselves over the past decade. But a minimal set of questions could certainly be fitted into one of them, despite the complexity of designing and implementing international continuous surveys. In our experience, even a minimum set of two questions would be extremely useful. The first question should measure the shares of self-identified vegetarians and vegans, and the second question could examine agreement with five statements: the first three would assess attitudes towards classical motives (health, environmental and ethical), and the last two would measure perceptions of veganism and vegetarianism separately (which unfortunately we did not do in our study). Such a short set of only seven variables would already allow us to make comprehensive cross-national comparative analyses of both the self-assessed dimensions of veg*ism and, to an even greater extent, more complex multidimensional analyses of its perceptions.

Our research showed that when analysing survey data on perceptions of veg*ism cluster analysis enables a more detailed picture, which goes beyond a black and white distinction between sympathy and rejection. One of the groups that emerged in our analysis of both national samples clearly demonstrates that individual (mis)appreciation and (non)acceptance of the reasons/motives for rejecting meat does not necessarily have an impact on personal (non)acceptance of the practice of veganism itself.

If we acknowledge the general observation of the contemporary meta-study, that "despite the boom in research on VEG in recent years and the great and laudable efforts made to date by researchers, the study of the phenomenon is still in its early stages" (Salehi et. al., 2023, p. 18), efforts to conduct more systematic and regular comparative quantitative research on the phenomenon, and especially on its perceptions, seem well worthwhile. The study presented here could perhaps provide a humble model for this.

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Izvorni znanstveni rad

Rasprostranjenost i javna percepcija vegetarijanstva i veganstva: komparativna analiza nacionalno reprezentativnih uzoraka iz Slovenije i Hrvatske

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Sažetak

Unatoč znatnom porastu istraživanja o vegetarijanstvu i veganstvu (veg*stvu), međunacionalne studije koje ispituju njihovu opću društvenu percepciju ostaju rijetke. Ovo istraživanje empirijski analizira nacionalno reprezentativne uzorke iz Slovenije i Hrvatske. Rezultati pokazuju dominaciju kulture utemeljene na konzumaciji mesa u obje zemlje, pri čemu veg*stvo ostaje marginalna pojava. Stavovi javnosti prema veg*stvu pretežito su negativni, premda nešto blaži u Hrvatskoj nego u Sloveniji. Klaster analiza identificira tri skupine ispitanika: izrazito odbacujuće, umjereno naklonjene te međuskupinu koja nije uvjerena argumentima za odricanje od životinjskih proizvoda, ali istodobno pokazuje najmanju kritičnost prema samoj praksi veganstva. To sugerira da osobno neprihvaćanje obrazloženja ne mora nužno značiti i odbacivanje prakse. U Hrvatskoj je skupina koja odbacuje veg*stvo znatno manja, a skupina sklonija veg*stvu veća nego u Sloveniji. U obje zemlje žene i mlađe osobe iskazuju manje negativne stavove prema veganstvu. Obrazovanje ima značajan utjecaj samo u Sloveniji, gdje su obrazovaniji ispitanici prijemčiviji klasičnim argumentima za veg*stvo te iskazuju manju odbojnost prema veganstvu. Na koncu, predlažemo kratak set pitanja pogodnih za uključivanje u jedno od velikih periodičnih međunarodnih istraživanja, kako bi se omogućila sveobuhvatna analiza društvenih i kulturnih dimenzija veg*stva i njegove percepcije u različitim društvima i kulturama.

Ključne riječi: vegetarijanstvo, veganstvo, konzumacija mesa, Slovenija, Hrvatska, klaster analiza.