

PERCEPTIONS, CONSUMPTION PATTERNS, AND PURCHASING BEHAVIOURS OF VEGAN PRODUCTS IN SLOVAKIA: A COMPARATIVE STUDY OF FLEXITARIANS, OMNIVORES, VEGANS, AND VEGETARIANS

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Abstract

The study investigates the factors influencing Slovak consumers' perceptions, consumption, and purchasing behaviors regarding vegan products across different dietary styles. It examines the varying motives behind purchasing decisions among vegans, vegetarians, flexitarians, and omnivores, differences in their consumption and buying frequencies, and the significance of selected factors during the purchase process. Research questions were derived from a literature review, and research gaps were identified. Data were collected via an online questionnaire with criteria including the purchase of vegan products and a minimum age of 18. The final sample included 915 respondents from an initial 2,011 participants. A Likert scale measured motives for purchasing vegan products, consumption patterns, and the importance of various criteria during purchase. Statistical analysis was performed using IBM SPSS Statistics Grad Pack 28.0 and XL Stat version 4.1, employing non-parametric tests like the Kruskal-Wallis test with Dunn-Bonferroni post hoc method, the Friedman test with Nemenyi's multiple pairwise comparisons, and Categorical Principal Components Analysis (CATPCA). Findings revealed that vegans, vegetarians, flexitarians, and omnivores all consume vegan products to some degree, with approximately 38% consuming only vegan products. Vegans and vegetarians strongly endorsed ethical and health reasons for purchasing vegan products, while omnivores and flexitarians cited positive past experiences. All groups disagreed on the financial aspect. The primary factors influencing the purchase of vegan products were taste, based on previous positive experiences, followed by product composition, price, and ecological considerations.

Key words: *vegans, vegetarians, consumer behaviour, rationality and irrationality in purchasing behaviour, consumer perception*

INTRODUCTION

New consumption habits stand out against the idea of a rational consumer and consumer behavior aimed at maximizing utility according to budget constraints [6, 9, 11]. Consumers are the most significant barrier to innovation in the food sector [12]. It has been increasingly acknowledged that food choice is crucial for health and global sustainability [16]. At the same time, ensuring food security - defined as reliable access to an adequate quantity of affordable, nutritious food - is critical not only for maintaining individual health, but also for supporting societal stability [30]. There are various health issues,

such as obesity, diabetes, heart disease, cancer, osteoporosis, and dental conditions, that require a specialized diet. Changes in our lifestyle are reflected in a trend towards healthier eating [38], based on natural foods with a reduced calorie content [37]. Vegetarianism is considered an alternative form of nutrition oriented on a plant-based diet. Hargreaves et al. [17] defines the vegetarian diet as “a dietary pattern that excludes meat, meat-derived foods, and, to different extents, other animal products”. Often, the diet is also the living philosophy focused on health care, animal respect and sustainable consumption [39]. Recently, this way of eating has appeared more and more

often worldwide, as growing awareness of ethical concerns influences people's dietary choices [52]. Supporters of vegetarianism often point uncritically only to the benefits, and opponents, on the other hand, only to the risks. However, the truth is, as is usually the case, somewhere in the middle. According to Wang et al. [57], vegetarianism has both benefits and risks. Rejection of meat has appeared in various forms throughout human history. Rational reasons may include concerns relating to health, environmental sustainability, animal welfare, and cultural or religious beliefs. Therefore, the consumption of animal meat is being more closely examined because of its impact on ethics, health, and the environment [45].

On the other hand, irrational reasons may include personal preferences or aversions that have little to do with health or ethical concerns, such as not liking the taste or texture of meat or being put off by the sight or smell of animal products. Overall, research suggests that people may be motivated by rational and irrational reasons when choosing a vegetarian or vegan lifestyle. For example, a study by ABCNews [1] found that concerns about animal welfare among Australian adults adopting a vegetarian or vegan lifestyle were the most cited reasons, followed by health and environmental sustainability. These reasons reflect rational incentives for the adoption of a plant-based diet. Other studies have found that personal preferences, taste aversions, and emotional reactions to meat and animal products can also have a role to play in the decision to go vegetarian or vegan. For instance, Hargreaves et al. [18] found that some individuals reported experiencing aversion or disgust towards meat or animal products, which motivated them to adopt a vegetarian or vegan diet. Similarly, a study by Kwasny et al. [26] found that some individuals reported that negative emotions towards meat, such as guilt or disgust, affected their decision to a plant-based diet. However, the fact remains that according to the concept of rational behavior, people consider the future in their current decision-making [32].

Up to the above mentioned and even the term vegetarianism is not "new" (firstly it was used in 1847 by the Vegetarian Society in England, promoting this lifestyle's beneficial effects), an increasing aspiration for a healthy and modern lifestyle (among the centuries) has helped significantly improve recent vegetarian and vegan statistics – global survey carried out in 2021 discovered that 81% consumers tried plant milk, 48% tried other alternatives to dairy products, 44% tried vegan meat alternatives and 25% tried a vegan egg substitute [41]. Despite the growing trend towards vegetarian and vegan lifestyles, these choices still represent a minority of the world's population. However, the growing interest and awareness of plant-based diets indicate a shift in eating habits, consumer preferences, and rational and irrational consumer behavior.

As indicated above, some vegans opt to make the conversion because of diet changes and medical needs, and others because they do not want to add to the cruelty to livestock and the use of animal products. Many people choose a vegan lifestyle due to the environmental consequences of cattle farming, not to overlook its impact on overall climate change [51]. While the preference for vegetarian diets has changed, the popularity of vegetarianism is high nowadays [3, 56]. Consumer use of vegan foods and lifestyles has become increasingly popular, and veganism has increased worldwide. The increased prevalence of those following a vegetarian diet served as an impetus to investigate differences in the behaviors and properties of those who chose a vegetarian diet compared to those who did not. The studies of Segovia-Siapco and Sabaté [49] and Sanchez-Sabate, Badilla-Briones and Sabaté [48] state that in such countries as the U.S. or the U.K., vegetarians make up less than 5% of their population. According to a Gallup poll [14], 5% of U.S. adults identify as vegetarians, and the vegan population in the U.S. accounts for 3% of adults. Currently, the account of those who eat vegetarian or vegan 100% of the time is at 3% of the populace and is rising. Based on Google Trends, interest in veganism reached an all-time high in 2020. This reflects

the significant increase in the popularity of plant-based diets and vegan lifestyles [19].

There have even been several studies on consumers' perceptions, consumption, and purchasing behavior concerning vegan products [46, 31, 24, 22, 35] that have investigated various factors such as attitudes towards veganism, health and nutrition beliefs, ethical concerns, taste preferences, and the availability of vegan products in the market; a gap is now opening up, creating a new phenomenon where there is a need to find out how consumers choose to change their lifestyle and approach to life and, most importantly, why. Food consumption is a social token that forms social expressions and ways of life. People are facing a comprehensive variety of options in all spheres of life. Consequently, self-identification is instead governed by people's lifestyles or actual procedures as classical differences, even though the socio-demographic characteristics of consumers could still influence certain areas. The habitual routines that people inducted into the practice are open to change reflexively, which changes their identity. From this viewpoint, food consumption can be seen as a genuine choice in people's lifestyle decisions in the late modern period [53]. Veganism is "a specific style of eating that involves eating only plant-based foods and absenteeism from all livestock products" [53].

The question remains how consumers make decisions and what has the most significant influence on them. At the same time, it is interesting to see how the consumer places himself in the selected group of flexitarians, omnivores, vegans, and vegetarians.

Studies and research were made on the motivation for vegetarianism. A study by Jabs, Devine, and Sobal [23] proposed two rationales for vegetarian dietary choices: health and ethics. Studies, e.g., by Hoffman et al. [20], Radnitz, Beezhold, and DiMatteo [40] and Ruby et al. [47], have shown that the main driving forces for vegetarians are both health and ethics. An overview document by Rosenfeld [44] and by Fox and Ward [13] proposes that since ethical concerns are split into environmental and animal concerns, the

more agent vegetarian concerns are environment, health, and animal concerns [25]. Also commonly discussed is veganism, a lifestyle choice and movement that is becoming increasingly popular. The number of people deciding to go vegan is growing, and the decision itself is influenced by several factors [21]: ethical, health, economic, hedonic, empathy towards animals, animal rights, and individual responsibility. In particular, three motifs - empathy for animals, responsibility, and animal rights - are key factors determining consumers' self-identification as vegan-centric subjects. The critical point is that veganism assumes a variety of attitudes and different motifs regarding animal rights, environmental and health aspects, moral/ethical concerns, sustainable lifestyles, spiritual/religious aspects, nutrition, and individual health [15, 50]. Although vegan consumerism can be considered a consumer interest, as per Lawo et al. [27], it is more than just that. It is part of a drive to transform society and consumers into environmentalists or anti-consumerists.

As for omnivores, there was a notable difference between them and vegetarians. When motivated to make food choices, vegetarians scored higher on the factors 'health,' 'ethical concern,' and 'convenience and price.' In contrast, omnivores scored higher on the factors 'sensory appeal' and 'weight control.' For dietary identity, vegetarians scored higher on the factors "complex motivation" and "strictness," while omnivores, on the other hand, scored higher on the factors "out-group respect" and "public respect." Though the reasons differ, the authors validated that vegetarians and omnivores prefer plant-based foods [25].

As Dagevos [10] explained, flexitarianism enters the picture when switching to a diet that reduces overall meat consumption and replaces meat products with those from plants (protein) without the need to become a complete vegetarian and stop eating meat. It can be defined as consuming food where meat is eaten occasionally without altogether avoiding it. Contrary to the original explanation of flexitarians, which is based on

vegetarianism - a flexitarian is a vegetarian who occasionally eats meat [43, 44].

However, many factors influence consumers to buy products according to their dietary style. It is essential to understand and recognize them.

For this purpose, the main objective of the present study is to identify the factors influencing the perception, consumption and purchasing process of vegan products among Slovak consumers of different dietary styles, thus pointing differences in purchasing motives across selected dietary types - vegans, vegetarians, flexitarians and omnivores, differences in consumption and purchasing frequency across selected dietary types as well as differences in the significance selected factors under consideration at purchase of vegan products.

MATERIALS AND METHODS

The research aimed to study factors determining the perception, consumption, and purchasing process of vegan products among Slovak consumers of different dietary styles (vegans, vegetarians, flexitarians, and omnivores). Based on the literature review and the existing research gap, the following research questions were formulated:

RQ1: There exist differences in purchasing motives across selected dietary types.

RQ2: There exist differences in consumption and purchasing frequency across selected dietary types.

RQ3: There exist differences in the importance of selected factors when purchasing vegan products.

Research design and data collection

The research was based on prime data from an online questionnaire. In total, 2,011 respondents participated in the survey. The main inclusive criteria were the purchase of vegan products and the minimum respondent's age was 18. Therefore, the final research sample comprised 915 respondents. The mean age of respondents is 25.8 years, and 82.2 % are females. Most respondents have either secondary education (44.8%) or university education (47%). More than 46% have student status or are economically active. Most live in

cities with no more than 10,000 inhabitants (40%) or over 50,000 inhabitants (38.4%). The research focused on purchasing behavior, including purchasing motives (ethical, health, financial, social, or others), followed by questions indicating the purchase and consumption of selected vegan products frequent on the Slovak market. Moreover, a survey was oriented on identifying essential factors during the purchase of vegan products, such as budget expenditure, favourite brands, and place of purchase.

Measurements and Analysis:

The Likert scale was applied to identify the motives for purchasing vegan products (5-point scale where 1 = disagree and 5 = agree). Consumption and purchasing patterns were indicated using a 5-point scale (1-I do not consume, 2- occasionally, 3 - a few times per month, 4- every week, and 5 – every day). Furthermore, a 5-point scale was used to examine the importance of selected criteria when purchasing vegan products (1 – very unimportant factor, 5 – significant factor). Statistical analysis was done in IBM SPSS Statistics Grad Pack 28.0 and XLStat version 4.1. Non-parametric tests were applied, such as the Kruskal-Wallis test with the Dunn-Bonferroni post hoc method, the Friedman test with Multiple pairwise comparisons using Nemenyi's procedure and Categorical Principal Components Analysis (CATPCA).

RESULTS AND DISCUSSIONS

The questionnaire survey revealed that vegans, vegetarians, flexitarians, and omnivores consume vegan products to a certain extent. Approximately 38% stated that they consume vegan products only. In comparison, the cases when other family members consume vegan products were indicated by 51% (my spouse/ partner - 24%, my children - 12%, or my parents – 14%). The results showed that, on average, respondents indicated that the main reasons for purchasing vegan products are ethical and health. In contrast, social status and financial aspects do not play essential roles.

Nevertheless, we study results based on different dietary types (omnivores,

flexitarians, vegetarians, and vegans). In that case, several differences are shown, and applying the Kruskal-Wallis test with the Dunn-Bonferroni post hoc method revealed statistically significant differences across the aforementioned dietary types (Table 1). On average, both vegan and vegetarian groups strongly agreed with the ethical and health

aspects of purchasing vegan products. In the case of omnivores and flexitarians, the highest scores indicating favorable agreement were obtained for curiosity and positive previous experiences with vegan products. All four dietary groups indicated disagreement regarding the financial aspect.

Table 1. Motives for purchasing vegan products

Aspects/ Dietary type	Omnivores (n=216)	Flexitarian (n=222)	Vegetarian (n=274)	Vegan (n=203)	Overall (n=915)
Ethical aspect*	3.01 ^a	3.49 ^b	4.46 ^c	4.51 ^c	3.90
Health aspect*	3.25 ^a	3.64 ^b	3.95 ^c	4.10 ^c	3.76
Curiosity*	3.88 ^a	3.90 ^a	3.81 ^{ab}	3.55 ^b	3.77
Social status*	2.04 ^a	2.15 ^{ab}	2.44 ^b	2.38 ^{ab}	2.26
Financial aspect	2.31	2.23	2.29	2.16	2.24
Positive previous experience*	3.68 ^{ab}	3.72 ^a	3.52 ^{ab}	3.35 ^b	3.56

* – Significant differences between aspects and dietary types by the Kruskal-Wallis test ($p < 0.05$). Means in the identical row with various subscripts are statistically various by the Dunn-Bonferroni post hoc method ($p \leq 0.05$).

Source: Results of authors' research.

Furthermore, the research was oriented on consumption patterns related to vegan products. Most respondents consume plant-based milk, plant-based spreads, and tofu

afew times a month, followed by plant-based yogurt and hummus. The rest of the vegan food categories were indicated by occasional consumption (Table 2).

Table 2. Consumption frequency

Vegan products/ Dietary type	Omnivores (n=216)	Flexitarian (n=222)	Vegetarian (n=274)	Vegan (n=203)	Overall (n=915)
Plant-based milk*	2.28 ^a	2.77 ^b	3.60 ^c	3.99 ^d	3.02
Plant-based spreads*	2.45 ^a	2.84 ^b	3.53 ^c	3.59 ^c	3.13
Tofu*	2.26 ^a	2.71 ^b	3.54 ^c	3.82 ^d	3.2
Seitan*	1.28 ^a	1.55 ^b	2.06 ^c	2.35 ^d	1.82
Vegan cheese*	1.46 ^a	1.73 ^b	2.00 ^c	2.58 ^d	1.98
Plant-based yoghurt*	2.01 ^a	2.45 ^b	2.83 ^c	2.14 ^d	2.64
Vegan semi-products*	1.52 ^a	1.81 ^b	2.40 ^c	2.45 ^c	2.06
Plant-based ice cream*	1.31 ^a	1.61 ^b	1.80 ^c	1.02 ^d	1.71
Vegan chocolate*	1.55 ^a	1.89 ^b	2.15 ^c	2.66 ^d	2.1
Vegan sausages*	1.45 ^a	1.71 ^b	2.38 ^c	2.35 ^c	1.99
Vegan protein bars*	1.91 ^a	1.95 ^a	2.12 ^{ab}	2.29 ^b	2.08
Plant-based meat products*	1.46 ^a	1.74 ^b	2.52 ^c	2.47 ^c	2.07
Hummus*	2.03 ^a	2.58 ^b	2.93 ^c	2.05 ^c	2.67

* – Significant differences between vegan products and dietary types by the Kruskal-Wallis test ($p < 0.05$). Means in the identical row with various subscripts are statistically various by the Dunn-Bonferroni post hoc method ($p \leq 0.05$).

Source: Results of authors' research.

Kruskal-Wallis test with the Dunn-Bonferroni post hoc method revealed statistically significant differences across dietary groups. Vegans evaluated the highest consumption rate > vegetarians > flexitarians > omnivores. Vegans and vegetarians consume plant-based milk, spreads, and tofu weekly, while omnivores consume it only occasionally. Vegans have the highest consumption scores in all vegan food categories, with one exception. In the case of plant-based ice cream, the majority indicated zero consumption.

In addition, purchasing behavior was examined. Generally, vegan products are mostly purchased at retail stores (every week), followed by shops and specialty shops (a few times per month). Respondents indicated that their purchase frequency was similar to its

consumption frequency. Most purchase plant-based milk, spreads, tofu, hummus, and plant-based yogurts (a few times a month). Statistically significant differences again exist within dietary groups (Table 3). Vegans and vegetarians purchase these products more frequently (every week or a few times per month), while flexitarians and omnivores only occasionally or not at all. Most respondents (49.73%) stated they spent an average of 5 to 20 euros on vegan products per week. The highest weekly expenses were indicated by vegans (30-20 euros – 26%, 20-11 euros – 33%). Omnivores indicated the lowest expenditure (up to 5 euros). Alpro, Lunter, and private-label K – K-veggie were evaluated as the most favorite vegan brands on the Slovak market.

Table 3. Purchasing frequency of vegan products

Vegan products/ Dietary type	Omnivores (n= 216)	Flexitarian (n= 222)	Vegetarian (n=274)	Vegan (n=203)	Overall (n=915)
Plant-based milk*	2.10 ^a	2.55 ^b	3.01 ^c	3.36 ^d	2.79
Plant-based spreads*	2.27 ^a	2.64 ^b	3.15 ^c	3.21 ^c	2.83
Tofu*	2.15 ^a	2.63 ^b	3.29 ^c	3.45 ^c	2.91
Seitan*	1.26 ^a	1.49 ^b	1.84 ^c	2.09 ^d	1.69
Vegan cheese*	1.44 ^a	1.64 ^a	1.86 ^b	2.32 ^c	1.84
Plant-based yoghurt*	1.91 ^a	2.25 ^b	2.59 ^c	2.90 ^c	2.44
Vegan semi-products*	1.45 ^a	1.67 ^b	2.27 ^c	2.26 ^c	1.93
Plant-based ice cream*	1.31 ^a	1.56 ^b	1.75 ^c	1.91 ^d	1.65
Vegan chocolate*	1.47 ^a	1.76 ^b	1.98 ^c	2.45 ^d	1.95
Vegan protein bars*	1.80 ^a	1.91 ^a	1.98 ^{ab}	2.17 ^b	1.98
Plant-based meat products*	1.38 ^a	1.75 ^b	2.30 ^c	2.27 ^c	1.94
Hummus*	1.95 ^a	2.35 ^b	2.60 ^{bc}	2.73 ^c	2.42
Specialty shop*	2.29 ^a	2.49 ^b	2.64 ^{bc}	2.79 ^c	2.57
Shops*	2.50 ^a	2.57 ^{ab}	2.75 ^b	2.74 ^b	2.64
E-shop*	2.09 ^a	2.20 ^{ab}	2.24 ^b	2.20 ^b	2.18
Retail stores*	3.02 ^a	3.38 ^b	3.68 ^c	3.69 ^c	3.68

* – Significant differences between vegan products and dietary types by the Kruskal-Wallis test ($p < 0.05$). Means in the identical row with various subscripts are statistically various by the Dunn-Bonferroni post hoc method ($p \leq 0.05$)

Source: Results of authors' research.

Moreover, the paper studies factors that are considered when purchasing vegan products. Respondents used a 5-point scale where 1 represented a very unimportant factor, and 5 represented a significant factor. Friedman test confirmed statistically significant differences in importance evaluation (p -value= 0.0001). Moreover, the Nemenyi test showed

specifically where these differences occurred (Table 4). Based on the results, the most critical factors in purchasing vegan products were taste from previous experience, followed by product composition, price, and ecological aspects. Packaging, brand, and producers were indicated as unimportant.

Table 4. Factors considered during the purchase of vegan products

Sample	Mean of ranks	Groups					
Packaging	3.57	A					
Brand	4.34		B				
Producer	4.45		B				
Country of origin	4.99			C			
References	5.3			C	D		
Discount	5.55				D	E	
Ecological aspect	5.85					E	F
Price	6.09						F
Composition	6.85						G
Taste - previous experience	8.01						H

Rotated Component Loadings

	Dimension		
	1	2	3
Producer	.835	-.013	.150
Origin	.770	.030	.100
Brand	.733	.003	.220
Ecological aspect	.688	.240	.109
Product Composition	.632	.440	-.113
Price	.070	.845	.064
Discount	-.049	.745	.236
Taste – previous experience	.246	.716	-.045
Packaging	.249	-.081	.813
References	.085	.321	.662

Variable Principal Normalization.

a. Rotation Method: Varimax with Kaiser Normalization. Rotation failed to converge in 5 iterations. (Convergence =.000).

Source: Results of authors' research.

Furthermore, CATPCA was applied to identify latent components (factors). Results showed three latent components. The first component involves the following factors: producer, origin, brand, ecological aspect, and product composition. All factors are related to overall product quality. The second latent factor comprises price, discount, and taste from previous experience. The last component includes two factors: packaging and references. In addition, respondents stated that references and free sample tasting would attract their attention toward the purchase of vegan products.

As mentioned in the introduction of this article, many studies have been conducted on consumer perception, consumption, and purchasing behavior toward vegan products. These studies have examined various factors such as attitudes towards veganism, health and nutrition beliefs, ethical concerns, taste preferences, and vegan product availability on the open market. Despite the above, there is still a gap in this area, and therefore, this research aimed to investigate the factors determining the perception, consumption, and purchase process of vegan products among

Slovak consumers of different dietary styles (vegans, vegetarians, flexitarians, and omnivores). Key international authors in this field include Ruby et al. [46], Kilian and Hamm [24], Ruby and Heine [47], Annunziata and Vecchio [4], and Alcorta et al. [2] for example, who have produced the following findings. Consumers have a growing interest and awareness of veganism and plant-based diets. Many consumers are motivated to choose vegan products because of health, animal welfare, and environmental sustainability concerns. Consumers often perceive vegan products as healthier options compared to animal products. This is because vegan products are often associated with lower fat, calorie, and cholesterol content. Taste is an essential factor in consumer choice, and many consumers associate vegan products with less appealing tastes. However, studies have found that taste perception can be influenced by factors such as preparation method, flavoring, and presentation. The availability and accessibility of vegan products can significantly influence consumer purchasing behavior. Consumers are more inclined to purchase vegan products if they

are readily available in supermarkets, restaurants, and other food outlets. Price is an essential factor in consumer purchasing behavior, and many vegan products are perceived to be more expensive than animal products. However, studies have shown that people are willing to pay a higher price for vegan products if they perceive them to be of higher quality or in line with their values. Social norms and influences may also influence consumer behavior towards vegan products. Studies have found that social norms and peer pressure may discourage some consumers from choosing vegan products. In contrast, others may be more likely to try vegan products if they perceive them as a popular or fashionable choice. Other scientific findings on consumer behavior and perceptions of vegan products show that consumers who identify as flexitarian (those who eat a predominantly plant-based diet but occasionally consume animal products) have greater likelihood to purchase vegan products if they perceive them to be healthier, tastier and more convenient than their animal counterparts [7]; while consumers who identify as eco-conscious have greater likelihood to buy plant-based alternatives to meat because they perceive them to be more sustainable than traditional meat products [55]. Another study found that consumers who purchase plant-based meat alternatives tend to value health, ethical considerations, and environmental concerns as their primary motivations rather than taste or price [8]. Ruby and Heine [47] found that consumers who perceive vegan products as expressing their identity or values (e.g., environmentalism or animal rights) are likelier to purchase and consume them.

As mentioned above, rational and irrational factors influence consumer perceptions and behavior towards vegan products. Rational factors include the nutritional advantages of a plant-based diet and the environmental impact of animal production. Conversely, irrational factors may include emotions, social identity, and cultural norms. Evidence of this can be found, for example, in a study published in the *Journal of Consumer Research*, in which researchers discovered that consumers who

identified themselves as environmentally conscious had a greater likelihood to purchase plant-based products. They also revealed that these consumers perceived vegan products as healthier and more ethical than non-vegan alternatives [47]. Another study found that emotions significantly influenced consumers' purchase of vegan products. This study found that consumers experienced feelings of guilt and a moral obligation to reduce animal suffering, which motivated them to choose plant-based alternatives [28]. In addition, Malik and Jindal [29] aimed to investigate the effect of awareness of health, animal well-being, concern for the environment, and personal norms on customer attitudes towards the use of vegan products and its implications for intention for the purchase. Results of their research found that subjective worries do not influence attitudes and that moral concerns are more likely to have the following effect. The approach to vegan consumption positively influences the purchasing intention. Understanding these factors can help businesses and marketers develop effective strategies to promote plant-based alternatives. Results of the presented research show that in the case of Slovak consumers, the conclusions are almost the same as in the above research - different groups of consumers have different attitudes and behaviors towards vegan products. For example, vegans have a relatively positive attitude towards vegan products, while omnivores have a rather negative attitude. The results showed that Slovak respondents indicated ethical concerns and health as the main reasons for buying vegan products. On the contrary, social status and financial aspects do not play a significant role. On average, both vegans and vegetarians strongly agreed with the ethical and health aspects of buying vegan products. For omnivores and flexitarians, curiosity and positive previous experience with vegan products received the highest scores, indicating favorable agreement. All four dietary groups expressed disagreement with the financial aspect. Most respondents consumed plant-based milk, plant-based spreads, and tofu several times a month, followed by plant-based yogurts and hummus.

Vegans and vegetarians consume plant milk, spreads, and tofu weekly, while omnivores consume it only occasionally. Vegans have the highest consumption scores in all vegan food categories except plant-based ice cream. Generally, vegan products are mainly purchased in retail outlets, convenience stores, and specialty stores. The most relevant factors when buying vegan products are the taste from previous experience, the product's composition, the price, and the organic aspect. Packaging, brand, and manufacturers were identified as unimportant.

CONCLUSIONS

Recently, there has been a growing interest in veganism as a lifestyle, with more people adopting a plant-based diet for ethical, health, and environmental reasons. This has increased the availability and variety of vegan products, from food to personal care. However, the acceptance and consumption of vegan products vary among different consumer groups, including flexitarians, omnivores, vegans, and vegetarians. Consumer perceptions are crucial in determining the purchase behavior and consumption of vegan products. For example, omnivores may perceive vegan products negatively because they are not as tasty or satisfying as animal products [5].

On the other hand, flexitarians may have a more favorable perception of vegan products because they are already familiar with plant-based foods and may seek to reduce meat consumption [54]. Vegetarians and vegans are more likely to positively perceive vegan products because they are already committed to a plant-based lifestyle [46]. In addition, the degree of commitment to a plant-based lifestyle also influences consumption and purchasing behavior. Vegans are most likely to consume and purchase vegan products, while omnivores are least likely. Flexitarians and vegetarians may consume and purchase vegan products to varying degrees depending on their personal beliefs and lifestyle choices [10, 36].

Regarding purchasing behavior, price, and availability are two significant factors

influencing consumer decisions [58, 33, 42]. Vegan products can be more expensive than their non-vegan counterparts due to the cost of ingredients and manufacturing processes. This may deter some consumers from purchasing vegan products, especially those on a budget. Availability is also an issue, as vegan products may only be commonly available in certain regions or stores [34]. In conclusion, consumer perception, consumption, and purchasing behavior towards vegan products vary between different groups of consumers, including flexitarians, omnivores, vegans, and vegetarians. Consumer perception is critical in determining the purchase behavior and consumption of vegan products. Price and availability are two essential factors that can influence consumer choice.

This study also offers an interesting starting point for future research on factors influencing the perception, consumption, and purchase process and motives of vegans, vegetarians, flexitarians, and omnivores; in the case of Slovak consumers, further research is needed to investigate the factors influencing consumer behavior concerning vegan products and to develop strategies to increase the acceptance and consumption of vegan products among all consumer groups.

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REFERENCES

- [1]ABC News, 2020, Australia Talks: Data Explorer. <https://www.abc.net.au/news/2020-12-10/australia-talks-data-explorer-2019/12946988#/responses/what-is-the-main-reason-behind-your-decision-to-keep-a-vegan-or-vegetarian-diet>. Accessed on 9 March 2023.
- [2]Alcorta, A., Porta, A., Tárrega, A., Alvarez, M. D., Vaquero, M. P., 2021, Foods for Plant-Based Diets:

- Challenges and Innovations. *Foods*, 10 (2), 293. doi: 10.3390/foods10020293
- [3]Amato, P.R., Partridge, S.A., 2008, The Origins of Modern Vegetarianism. Eatveg.com. <http://www.eatveg.com/veghistory.htm> Accessed on 27 February 2023.
- [4]Annunziat, A., Vecchio, R., 2013, Consumers' attitudes towards sustainable food: A cluster analysis of Italian university students. *New Medit*, 12 (2), 47-56.
- [5]Asher, K. E., Peters, P., 2020, Meat reduction, vegetarianism, or chicken avoidance: U.S. omnivores' impressions of three meat-restricted diets. *British Food Journal*, 123 (1), 387–404. doi: 10.1108/BFJ-04-2020-0307
- [6]Barford, V., 2018, The rise of the part-time vegans. *AMASS*, 21(4), 48. Academic OneFile.
- [7]Bryant, C., Szejda, K., Parekh, N., Deshpande, V., Tse, B., 2019, A Survey of Consumer Perceptions of Plant-Based and Clean Meat in the USA, India, and China. *Frontiers in Sustainable Food Systems*, 3. doi: 10.3389/fsufs.2019.00011
- [8]Bryant, Ch. J., 2021, Plant-based animal product alternatives are healthier and more environmentally sustainable than animal products. *Future Foods*, 6, 100174. doi: 10.1016/j.fufo.2022.100174
- [9]Cembalo, L., Migliore, G., Schifani, G., 2012., Consumers in Postmodern Society and Alternative Food Networks: The Organic Food Fairs Case in Sicily. *New Medit*, 11 (3), 41-49. https://www.researchgate.net/publication/236591529_Consumers_in_Postmodern_Society_and_Alternative_Food_Networks_The_Organic_Food_Fairs_Case_in_Sicily Accessed on 2 March 2023.
- [10]Dagevos, H., 2021, Finding flexitarians: Current studies on meat eaters and meat reducers. *Trends in Food Science & Technology*, 114, 530–539. doi: 10.1016/j.tifs.2021.06.021
- [11]Džupina M., Hodinková D., Kiková H., 2016, CSR as a source of building the brand values. *Spoločenskyzodpovednépodnikanieakozdrojhodnôtznačky*. Nitra: UKF (In Slovak)
- [12]Faccio, E., Guiotto Nai Fovino, L., 2019, Food Neophobia or Distrust of Novelty? Exploring consumers' attitudes towards GMOS, insects and cultured meat, *Appl. Sci.* 2019, 9(20), 4440; <https://doi.org/10.3390/app9204440>
- [13]Fox, N., Ward, K., 2008, Health, ethics, and environment: A qualitative study of vegetarian motivations. *Appetite*, 50 (2-3), 422-429. doi: 10.1016/j.appet.2007.09.007
- [14]Gallup.News, 2020, Americans Who Are Vegetarians or Vegans (Trends). <https://news.gallup.com/poll/238346/americans-vegetarians-vegans-trends.aspx> Accessed on 15 March 2023.
- [15]Greenebaum, J., 2018, Vegans of color: Managing visible and invisible stigmas. *Food, Culture and Society*, 21, 680-697. doi: 10.1080/15528014.2018.1443734
- [16]Hansen, P. G., Schilling, M., Malthesen, M. S., 2019, Nudging healthy and sustainable food choices: three randomized controlled field experiments using a vegetarian lunch-default as a normative signal. *Journal of Public Health*, 43, 2, 392-397. doi: 10.1093/pubmed/fdz154
- [17]Hargreaves, S. M., Rosenfeld, D. L., Moreira, A. V. B., Zandonadi, R. P., 2023, Plant-based and vegetarian diets: an overview and definition of these dietary patterns. *European journal of nutrition*, 62(3), 1109-1121.Doi: 10.1007/s00394-023-03086-z
- [18]Hargreaves S. M., Raposo A., Saraiva A., Zandonadi R. P., 2021, Vegetarian Diet: An Overview through the Perspective of Quality-of-Life Domains. *Int J Environ Res Public Health*, 18, 8, 4067. doi: 10.3390/ijerph18084067
- [19]Ho, S., 2021, Google Trends 2020: Interest In Veganism At Record High According To New Report. *Green Queen*. <https://www.greenqueen.com.hk/google-trends-2020-interest-veganism-all-time-high-new-report/> Accessed on 20 February 2023.
- [20]Hoffman, S.R., Stallings, S.F., Bessinger, R.C., Brooks, G.T., 2013, Differences between health and ethical vegetarians. Strength of conviction, nutrition knowledge, dietary restriction, and duration of adherence. *Appetite*, 65, 139-144. doi: 10.1016/j.appet.2013.02.009
- [21]Horn, L., Budulan, M.-A., Loghin, M., 2022, Motivos para o Veganismo e a Influência das Mídias Sociais. *Cadernos De Investigação Do Mestrado Em Negócio Eletrónico*, 2 (1). doi: 10.56002/ceos.0067_cimne_1_2
- [22]Hungara, A., Nobre, H., 2022, The Life of Consumption Communities: A Study on Vegan Communities. *Journal of Creative Communications*, 17 (2), 231–240. doi: 10.1177/09732586221084377
- [23]Jabs, J., Devine, C. M., Sobal, J., 1998, Model of the process of adopting vegetarian diets: Health vegetarians and ethical vegetarians. *Journal of Nutrition Education*, 30(4), 196-202. doi: 10.1016/S0022-3182(98)70319-X
- [24]Kilian, D., Hamm, U., 2021, Perceptions of Vegan Food among Organic Food Consumers Following Different Diets. *Sustainability*, 13, 17, 9794; doi: 10.3390/su13179794
- [25]Kim, G., Oh, J., Cho, M., 2022, Differences between vegetarians and omnivores in food choice motivation and dietarian identity. *Foods*, 11(4), 539. doi: 10.3390/foods11040539
- [26]Kwasny, T., Dobernic, K., Riefler, P., 2022, Towards reduced meat consumption: A systematic literature review of intervention effectiveness, 2001–2019. *Appetite*, 168, 2022, 105739. doi: 10.1016/j.appet.2021.105739
- [27]Lawo, D., Esau, M., Engelbutzeder, P., Stevens, G., 2020, Going vegan: The role(s) of ICT in vegan practice transformation. *Sustainability*, 12 (12), 5184. doi: 10.3390/su12125184
- [28]Lin-Schilstra, L., Fischer, A. R.H., 2020, Consumer Moral Dilemma in the Choice of Animal-Friendly Meat Products. *Sustainability*, 12 (12), 4844. doi: 10.3390/su12124844

- [29]Malik, R., Jindal, T., 2022, Customers' Attitude Towards Vegan Products Consumption and Its Impact on Purchase Intension: An Indian Perspective. *Vision*, 0 (0). doi: 10.1177/09722629221087361
- [30]Marcuță, L., Popescu, A., Tindeche, C., Smedescu, D., Marcuță, A., 2021, Food security of the European Union and the influence of COVID-19, *Scientific Papers Series Management, Economic Engineering in Agriculture & Rural Development* 21(2), 383-392.
- [31]Miguel, I., Coelho, A., Bairrada, C. M., 2021, Modelling Attitude towards Consumption of Vegan Products. *Sustainability*, 13 (1), 9. doi: 10.3390/su13010009
- [32]Miljkovic, D., Nganje, W., de Chastenet, H., 2008, Economic factors affecting the increase in obesity in the United States: Differential response to price. *Food Policy*, 33, 48-60. doi: 10.1016/j.foodpol.2007.05.003
- [33]Muñoz, A., 2018, Factors That Influence Consumer Purchasing Decisions. <https://blog.saleslayer.com/factors-that-influence-consumer-purchasing-decisions> Accessed on 16 March 2023.
- [34]Pai, D. F., Cardoso Marques, A., Fuinhas, J. A., 2022, The cost of healthier and more sustainable food choices: Do plant-based consumers spend more on food? *Agric Food Econ.* 10 (1), 18. doi: 10.1186/s40100-022-00224-9
- [35]Paslakis, G., Richardson, C., Nöhre, M., Brähler, E., Holzapfel, Ch., Hilbert, A., de Zwaan, M., 2020, Prevalence and psychopathology of vegetarians and vegans – Results from a representative survey in Germany. *Scientific Reports*, 10, 6840. doi: 10.1038/s41598-020-63910-y
- [36]Perez-Cueto, F. J. A., Rini, L., Faber, I., Rasmussen, M. A., Bechtold, K.-B., Schnouteten, J. J., de Steur, H., 2022, How barriers towards plant-based food consumption differ according to dietary lifestyle: Findings from a consumer survey in 10 E.U. countries. *International Journal of Gastronomy and Food Science*, 29, 100587. doi: 10.1016/j.ijgfs.2022.100587
- [37]Popescu, A., Chiurciu, I., Soare, E., Stoicea, P., Iorga, A., 2022, Trends in average annual food consumption per inhabitant in Romania. *Scientific Papers Series Management, Economic Engineering in Agriculture & Rural Development*, 22(3), 561-580.
- [38]Pocol, C. B., Dumitraș, D. E., 2020, The importance of current consumption patterns of young generations for the priority of health nutrition aspects in the future cap. A preliminary study, *Scientific Papers Series Management, Economic Engineering in Agriculture & Rural Development* 20(20), 365-370.
- [39]Pocol, C. B., Marinescu, V., Amuza, A., Cadar, R. L., Rodideal, A. A., 2020, Sustainable vs. Unsustainable Food Consumption Behaviour: A Study among Students from Romania, Bulgaria and Moldova. *Sustainability*, 12(11), 4699.
- [40]Radnitz, C., Beezhold, B., Di Matteo, J., 2015, Investigation of lifestyle choices of individuals following a vegan diet for health and ethical reasons. *Appetite*, 90, 31-36. doi: 10.1016/j.appet.2015.02.026
- [41]Rakuten, 2021, Infographic: Plant-based food alternatives – Future or Present? Retrieved from <https://insight.rakuten.com/infographic-plant-based-food-alternatives-future-or-present/> Accessed on 10 March 2023.
- [42]Ramya, N., Ali, SA M., 2016, Factors affecting consumer buying behaviour. *International Journal of Applied Research*, 2 (10), 76-80.
- [43]Rosenfeld, D. L., Rothgerber, H., Tomiyama, A. J., 2020, From mostly vegetarian to fully vegetarian: Meat avoidance and the expression of social identity. *Food Quality and Preference*, 85, 103963. doi: 10.1016/j.foodqual.2020.103963
- [44]Rosenfeld, D.L., 2018, The psychology of vegetarianism: Recent advances and future directions. *Appetite*, 131, 125-138. doi: 10.1016/j.appet.2018.09.011
- [45]Rothgerber, H., Rosenfeld, D. L., 2021, Meat-related cognitive dissonance: The social psychology of eating animals. *Social and Personality Psychology Compass*, 15(5), e12592. <https://doi.org/10.1111/spc3.12592>
- [46]Ruby, M. B., Alvarenga, M. S., Rozin, P., Kirby, T. A., Richer, E., 2016, Attitudes toward beef and vegetarians in Argentina, Brazil, France, and the USA. *Appetite*, 96, 546-554. doi: 10.1016/j.appet.2015.11.018
- [47]Ruby, M. B., Heine, S. J., 2011, Meat, morals, and masculinity. *Appetite*, 56 (2), 447-450. doi: 10.1016/j.appet.2011.01.018
- [48]Sanchez-Sabate, R., Badilla-Briones, Y., Sabaté, J., 2019, Understanding attitudes towards reducing meat consumption for environmental reasons: A qualitative synthesis review. *Sustainability*, 11 (22), 6295. doi: 10.3390/su11226295
- [49]Segovia-Siapco, G., Sabaté, J., 2019, Health and sustainability outcomes of vegetarian dietary patterns: A revisit of the EPIC-Oxford and the Adventist Health Study-2 cohorts. *European Journal of Clinical Nutrition*, 72 (1), 60-70. doi: 10.1038/s41430-018-0310-z
- [50]Simons, J., Vierboom, C., Klink-Lehmann, J., Härten, I., Hartmann, M., 2021, Vegetarianism/veganism: A way to feel good. *Sustainability*, 13 (7), 3618. doi: 10.3390/su13073618
- [51]Slabakova, B., 2020, The Age of Veganism: Vegan Statistics for 2020 (Infographic). <https://healthcareers.co/vegan-statistics/> Accessed on 5 March 2023.
- [52]Smillie, L. D., Ruby, M. B., Tan, N. P., Stollard, L., Bastian, B., 2024, Differential responses to ethical vegetarian appeals: Exploring the role of traits, beliefs, and motives. *Journal of personality*, 92(3), 800-819. doi: 10.1111/jopy.12866
- [53]Sneijder, P., TeMolder, H., 2009, Normalizing ideological food choice and eating practices. *Identity work in online discussions on veganism. Appetite*, 52 (3), 621-630. doi: 10.1016/j.appet.2009.02.012
- [54]Spendrup, S., Persson Hovmalm, H., 2022, Consumer attitudes and beliefs towards plant-based food in different degrees of processing – The case of

Sweden. Food Quality and Preference, 102, 104673.
doi: 10.1016/j.foodqual.2022.104673

[55]Szenderák, J., Fróna, D., Rákos, M., 2022, Consumer Acceptance of Plant-Based Meat Substitutes: A Narrative Review. Foods, 11 (9), 1274.
doi: 10.3390/foods11091274

[56]Timko, C. A., Hormes, J. M., Chubski, J., 2012, Will the real vegetarian please stand up? An investigation of dietary restraint and eating disorder symptoms in vegetarians versus non-vegetarians. Appetite, 58 (3), 982-990. doi: 10.1016/j.appet.2012.02.005.

[57]Wang, T., Masedunskas, A., Willett, W. C., Fontana, L., 2023, Vegetarian and vegan diets: benefits and drawbacks. European heart journal, 44(36), 3423-3439, <https://doi.org/10.1093/eurheartj/ehad436>.

[58]Zhao, H., Yao, X., Liu, Z., Yang, Q., 2021, Impact of Pricing and Product Information on Consumer Buying Behaviour With Customer Satisfaction in a Mediating Role. Frontiers in Psychology, 12 – 2021. doi: 10.3389/fpsyg.2021.7201