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Original Paper

Exploring consumer behavior in sustainable food choices: a quantitative approach to generational differences and online marketing factors

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ABSTRACT

The topic of consumer preferences in sustainable and healthy food systems across generations focuses on the dynamics of changing consumer behavior and its impact on the development of a food market oriented toward sustainability and health. In recent years, consumer interest in the environmental and health impacts of their purchasing decisions has been increasing, leading to significant shifts in trends and preferences in food choices. The aim of this paper is to provide deeper insights into how marketing tools and communication strategies can support sustainable consumer behavior and contribute to shaping future food systems that reflect values of sustainability, health, and social responsibility. The article focuses on Generation Z consumers and analyzes the factors influencing their decision-making when selecting healthy and sustainable foods, which significantly affect their preferences for healthy eating. The study also examines the promotion of these products and how companies adapt their marketing strategies to changing consumer behavior. Non-parametric statistical methods, such as the Friedman test and Nemenyi post hoc pairwise comparison, are used to process the data, allowing for the identification of potentially statistically significant differences between marketing stimuli and activities that influence consumer behavior.

KEYWORDS: consumer preferences, sustainable food systems, healthy food systems, marketing strategies, green marketing, environmental responsibility

JEL CLASSIFICATION: M31, M37

INTRODUCTION

In recent years, sustainability has become one of the defining paradigms in consumer behavior research, reflecting the growing public awareness of environmental degradation, food waste,

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and health-related concerns. Consumers are increasingly evaluating their food choices not only through price and taste but also through ethical and ecological dimensions such as production transparency, carbon footprint, and social responsibility. This transformation of consumer priorities has led to a redefinition of how value is perceived in the food market, emphasizing sustainable and health-oriented consumption patterns.

Consumer behavior is shifting toward environmentally and health-conscious products, requiring companies to adapt marketing strategies. Green marketing and online platforms play a key role in shaping sustainable consumer attitudes and decisions. Sustainable marketing management now integrates environmental and social aspects into corporate strategies, going beyond traditional distribution channels. The new EU regulations on the eco-design of sustainable products (European Commission, 2024) promote environmental sustainability in the food industry by reducing energy consumption, extending product lifespan, improving recyclability, and minimizing harmful substances. Companies are also required to disclose data on unsold products and the reasons for their disposal, reinforcing corporate transparency and accountability.

As consumer interest in environmentally responsible products increases, firms benefit from aligning their marketing strategies with sustainability trends. Transparent communication about the ecological properties and origin of products has become essential, as consumers increasingly demand information about production methods and environmental impacts (Frey et al., 2023). In Slovakia, agriculture plays a dual role — food production and landscape management — contributing to environmental protection while facing structural and climate-related challenges that affect production and prices. The EU's Farm to Fork Strategy aims to achieve carbon neutrality by 2050 and promote sustainability throughout the entire food value chain (Brodová et al., 2021).

Consumer decisions are strongly influenced by environmental awareness, online reviews, and peer experiences (Peng Wu et al., 2024). Studies show that social media significantly shapes consumer attitudes, particularly among younger generations (Frey et al., 2023). Therefore, the development of sustainable marketing strategies must encourage consumers to evaluate products based on environmental criteria such as origin, production methods, recyclability, and ecological footprint. Transparent communication about manufacturing processes and compliance with legislation is crucial, as greenwashing can seriously damage consumer trust (Smolka et al., 2021; Lewandowska et al., 2017).

Consumer decision-making is complex, influenced by product attributes, brand image, and perceived value. Motivation can be analyzed using Maslow's hierarchy of needs, with satisfaction understood as a subjective evaluation of how well a product meets expectations (Schiebler, 2025; Richardson, 2020; Oliver, 2010). Research also highlights generational differences: Generation Z emphasizes convenience and digital access, while Generation Y focuses more on price and local origin (Chen et al., 2024). Younger consumers often exhibit lower food management skills, leading to increased food waste (Karunasena et al., 2021).

Green marketing and sustainable strategies have thus become essential for modern agriculture and the food industry. Companies that transparently communicate ecological benefits, adopt responsible production practices, and encourage environmentally conscious behavior gain a competitive advantage and contribute to sustainable development (Irfan et al., 2025). For Generation Z, sustainability knowledge, positive attitudes, and authentic communication via social media and influencers play a key role in fostering brand identification and motivating

eco-friendly purchases (Dragolea et al., 2023; Munaro et al., 2024). Environmental knowledge, altruistic attitudes, and perceived innovativeness significantly affect young consumers' interest in green products (Vishnoi et al., 2025; László & Wahlen, 2024). Digital platforms therefore play a vital role in educating, motivating, and engaging consumers, transforming ecological attitudes into actual purchase behavior (Eandhizhai et al., 2025; Song et al., 2024). According to Garg et al. (2024), consumer preferences are key to transitioning toward healthier and more sustainable food systems. Effective marketing communication should encourage plant-based diets, reduce food waste, and reflect generational differences in attitudes toward sustainability. The importance of sustainable products and innovations lies at the core of corporate environmental and social responsibility. Although definitions of "sustainable consumption" and "green marketing innovation" vary, studies consistently show their strong interconnection, with green marketing innovations positively influencing firm performance (Varzakas et al., 2024).

Sustainable packaging solutions that integrate economic, social, and environmental aspects throughout the product life cycle represent a key step in ecological transformation. Their aim is to promote the use of renewable energy sources, recyclable materials, and cleaner production processes, thereby supporting the development of a circular economy (Hussain et al., 2024). Meanwhile, food waste remains a serious global problem - approximately one-third of all food produced is lost or discarded, contributing to carbon and water footprint growth. Sustainable solutions based on the principles of reduction, recycling, reuse, and recovery are therefore crucial to minimizing food waste and promoting circularity within the food system (Sarker et al., 2024).

MATERIAL AND METHODS

This study examines how marketing strategies affect the sustainable purchasing behavior of young consumers, with a particular focus on generational differences and communication perspectives. It explores how contemporary marketing communication tools and digital platforms shape young consumers' attitudes and choices regarding sustainable consumption. By considering both rational and emotional factors influencing consumer decisions, the research aims to determine how companies can design marketing activities that effectively promote sustainability while appealing to the younger demographic. The outcomes of this research can contribute to the creation of strategies that successfully combine social responsibility with engagement and marketing effectiveness in the digital landscape.

Research Assumptions

To process and analyze the data obtained from the questionnaire survey, several research assumptions were formulated and subsequently tested.

Data Collection and Respondent Characteristics

Primary data were gathered through an online questionnaire created via Google Forms and shared on social media channels, mainly Facebook and Instagram, to reach the target audience -young consumers. The final research sample consisted of 300 participants, evenly divided by gender (50% female and 50% male).

The questionnaire method was selected as the principal data collection technique to evaluate the impact of marketing strategies on sustainable purchasing behavior. The chosen sample size

of 300 respondents was deemed relevant and adequate for the study's objectives. Data collection was conducted between November 1, 2024, and January 15, 2025. Participants were contacted electronically and informed that their participation was voluntary and anonymous. The questionnaire included questions designed to measure respondents' awareness of sustainability, their attitudes toward marketing communication related to sustainable products, and the influence of such communication on their actual purchasing behavior.

Data Processing and Statistical Analysis

Collected data were processed, organized into tables and charts, and then interpreted. In the initial phase, the representativeness of the sample - including gender distribution - was verified using suitable statistical tools.

Furthermore, the Friedman test (a nonparametric alternative to the two-way ANOVA) was used to compare multiple related samples.

The test statistics was computed as follows:

$$F = \left(\frac{12}{nk(k+1)} \sum_{j=1}^{k} R_j^2 \right) - 3n(k+1)$$

where:

- n – sample size,
- k – number of variants,
- R_j – sum of ranks within each column.

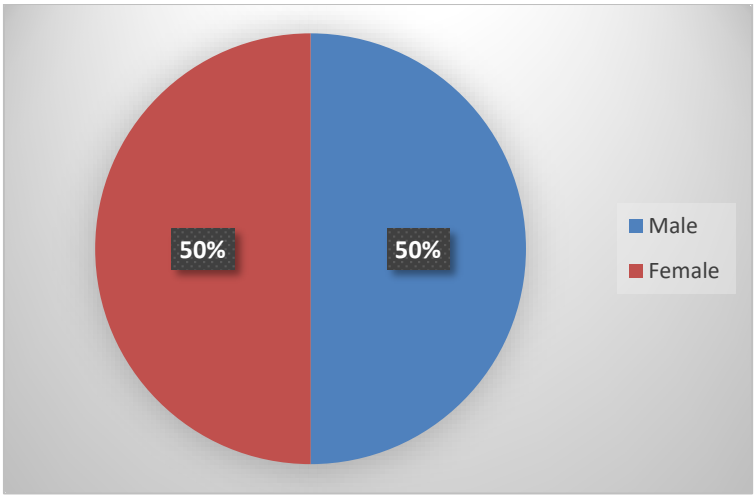
The null hypothesis H_0 is rejected if $F \geq \chi^2(\alpha, k-1)$. To identify specific differences between groups, Nemenyi's post-hoc test was subsequently used. This complementary analysis enabled a more detailed examination of the relationships between variables and provided deeper insights into how marketing strategies affect sustainable purchasing behavior among young consumers.

RESULTS AND DISCUSSION

In the context of today's fast-changing market environment, understanding the influence of marketing strategies on the sustainable purchasing behavior of young consumers is becoming increasingly essential. Young consumers represent a crucial segment whose values, digital activity, and social awareness significantly shape the future direction of sustainable consumption.

The research sample was composed of an equal proportion of male and female participants, including 150 men (50%) and 150 women (50%) (Fig. 1). This balanced gender structure enhances the representativeness of the sample and minimizes potential bias that could arise from gender-based differences in attitudes or purchasing behaviors. Maintaining this equality in respondent composition enables a more objective comparison of results and strengthens the reliability and validity of the subsequent statistical analyses.

Figure 1 Gender of respondents



Source: own processing

Table 1 presents the descriptive statistics of factors influencing consumer behavior in the selection of sustainable foods. The dataset includes 300 valid responses with no missing values, evaluated on a five-point Likert scale (1 = *not important at all*, 5 = *very important*).

Table 1 Descriptive statistics of factors influencing consumer behaviour in the selection of sustainable foods

Variable	Observations	Obs. with missing	Obs. without	Minimum	Maximum	Mean	Std. deviation
Price	300	0	300	1,000	5,000	4,037	1,061
Quality	300	0	300	1,000	5,000	4,103	0,896
Health Benefits	300	0	300	1,000	5,000	3,777	0,954
Sustainability	300	0	300	1,000	5,000	3,310	0,929
Convenience of Purchase	300	0	300	1,000	5,000	3,247	1,034
Brand	300	0	300	1,000	5,000	2,987	1,103
Durability	300	0	300	1,000	5,000	3,603	1,001
Storage	300	0	300	1,000	5,000	3,317	1,052
Current Promotion	300	0	300	1,000	5,000	2,657	1,100
Locality	300	0	300	1,000	5,000	3,197	1,069
Country of Origin	300	0	300	1,000	5,000	3,217	1,167
Budget	300	0	300	1,000	5,000	3,773	1,064
Recommendations and Reviews	300	0	300	1,000	5,000	3,333	1,095

Source: own processing

The results show that quality (M = 4.10) and price (M = 4.04) are the most influential factors, indicating that Generation Z consumers prioritize basic product attributes over purely ecological aspects. Health benefits (M = 3.78) and budget (M = 3.77) also play a key role, reflecting young consumers' focus on personal well-being and financial limits.

Moderately important were recommendations and reviews (M = 3.33) and convenience of purchase (M = 3.25), suggesting that online opinions and accessibility influence decisions. Sustainability (M = 3.31), locality (M = 3.22), and country of origin (M = 3.22) were rated

slightly lower, indicating awareness of environmental issues but limited behavioral impact - typical of the *attitude–behavior gap*.

The lowest-rated factors were brand (M = 2.99) and current promotion (M = 2.66), implying that traditional advertising has little influence compared to authentic digital communication. Standard deviations between 0.9–1.1 show moderate variation and consistent perceptions among respondents.

Overall, Generation Z values quality, price, and health most, while sustainability remains secondary. Marketing strategies should therefore combine economic, health, and ecological messages to effectively promote sustainable food consumption.

The analysis revealed that Generation Z consumers exhibit a pragmatic approach toward sustainable food purchasing. While environmental awareness is present, their decisions are primarily driven by quality, price, and health benefits. These findings align with research by Dragolea and Butnaru (2023) and Irfan and Bryła (2025), who emphasize that young consumers prioritize practical attributes before ethical considerations.

The Friedman test confirmed statistically significant differences between the evaluated factors ($p < 0.05$), supporting the hypothesis that not all determinants equally influence purchasing behavior. The Nemenyi post-hoc test further identified quality and price as significantly more important than promotion or brand, highlighting the limited effectiveness of traditional marketing tools in this consumer segment.

Generation Z's purchasing behavior is strongly shaped by digital interaction - particularly peer reviews and influencer recommendations - which emerged as moderately significant. This confirms findings by Song et al. (2026) and Eandhizhai (2025), suggesting that authentic digital communication and social proof have greater persuasive power than paid advertisements.

Although sustainability and locality received average ratings, they remain essential for long-term behavioral change. The gap between ecological attitudes and actual consumer behavior, known as the attitude–behavior gap, persists (Vishnoi et al., 2025). Marketing efforts must therefore focus on bridging this gap through emotional storytelling, transparent communication, and education emphasizing environmental responsibility.

These insights suggest that Generation Z's sustainable consumption is value-driven but convenience-bound. Brands targeting this demographic should integrate sustainability narratives into digital, interactive, and community-based platforms, while emphasizing tangible product attributes such as quality, health, and affordability.

CONCLUSIONS

The study contributes to understanding how marketing strategies influence Generation Z's sustainable food choices. Results confirm that quality, price, and health benefits are decisive in purchasing behavior, whereas environmental and ethical considerations, although recognized, play a secondary role. This highlights the ongoing need for companies to design integrated marketing strategies that merge economic, ecological, and social values.

To effectively engage young consumers, brands must prioritize transparency, authenticity, and digital engagement. Social media, influencer marketing, and peer recommendations are crucial tools for shaping positive attitudes toward sustainable consumption. Strengthening

environmental education and consumer literacy can further reduce the attitude–behavior gap and promote responsible food choices.

Future research should expand the analysis to include cross-cultural comparisons and longitudinal studies to observe how sustainability attitudes evolve as Generation Z matures and gains purchasing power.

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CONFLICT OF INTEREST
The authors declare no conflict of interests or competing interests.

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