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**CONSUMER PREFERENCES AND ATTITUDES TOWARDS
TRADITIONAL PRODUCTS AND MODERN PRODUCTION
SYSTEMS IN MONTENEGRO**

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ABSTRACT

Although consumers have been aware of the concepts of “organic”, “genetically modified”, and “traditional” products for more than three decades, little is known about their views on different food production systems and products in Montenegro. Thus, a comprehensive public opinion survey was conducted to assess consumer perceptions, preferences, and attitudes towards traditional agricultural varieties, genetically modified organisms (GMOs), pesticides, and local food production. The survey, conducted in 2020, collected responses from 1,178 participants, providing valuable insights into the evolving landscape of consumer choices related to food consumption. The results of the survey reveal a significant negative perception of GMOs, pesticides, and intensive production practices among consumers. Moreover, 94.5% of the participants indicated a preference for purchasing products made from local wheat varieties. The evaluation of consumer willingness to pay premium prices for traditional and locally sourced products revealed that the majority of the respondents are willing to invest in food products with specific attributes, including taste, smell, and nutritional benefits. Furthermore, an overwhelming 88.8% were willing to spend more on products made from local agricultural varieties, emphasizing a growing interest in authentic, locally sourced foods. In terms of agricultural production, the survey demonstrated strong support for the use of traditional plant varieties to create authentic, local products, with 78.5% of the respondents expressing a positive attitude. This finding has promising implications for the potential reintroduction and/or promotion of indigenous, traditional agricultural varieties and can inform policymakers and producers in their efforts to meet the growing demand for safe, authentic, and locally sourced food products in Montenegro and beyond.

Keywords: *Consumer perceptions, GMOs, Local food, Traditional varieties, Montenegro.*

INTRODUCTION

The choice of food is fundamentally determined by social and cultural influences, resulting in differences in the daily consumption of certain foods and in the tradition of preparation. These influences are subject to changes accompanied by the growth of the living standard, changes in lifestyle and the market offer (Jevšnik et al., 2008). A large number of studies indicate the risks of excessive use of pesticides, genetically modified organisms, food-borne diseases, and environmental pollution, to which a certain number of consumers attribute increasing importance, and for these reasons are increasingly turning to safe, healthy food with specific nutritional requirements (Wunderlich and Gatto, 2015; Botelho et al., 2016).

Traditional varieties are dynamic populations of agricultural plants characterized by historical origin or continuous cultivation in a certain area, to which traditional cultivation systems based on traditional knowledge are linked (Carrosio, 2005). In recent decades, increasing attention has been paid to these resources, not only due to their adaptive characteristics and potential resistance to harmful organisms but also because the products obtained from them possess some specific organoleptic properties (Westling et al., 2019). In addition to their specific taste, traditional varieties represent an excellent source of seed and planting material in organic production (Dwivedi et al., 2016). The cultivation and culinary use of old varieties has been uninterrupted for centuries due to tradition, heritage and emotional bondage (Koster and Mojet, 2015). However, benefits associated with modern varieties led to the replacement and often distinction of these varieties from fields (Velimirovic et al., 2021).

“Aversion to new foods”, or food neophobia, defined as the reluctance to eat, or the avoidance of new or unknown foods is often linked to genetically modified organisms (Faccio and Guiotto Nai Fovino, 2019). Similarly, the perceived risk of pesticide use by consumers tends to be relatively high, accompanied by distrust in control systems, motivating them toward organic production (Meagher, 2019).

In order to assess the interest in a certain group of products, a survey of consumer preferences is an efficient method in order to evaluate subjective aspirations toward certain groups of foods (Guiné et al., 2020). Each consumer has a set of preferences and values that depend on culture, education, individual taste, and many other factors. Therefore, consumer preferences represent a reliable basis for assessing the demand for certain goods on the market (Escribano and Almudena, 2012; Guiné et al., 2020).

The rapid expansion of Internet users enables easier access to a large number of respondents, and thus easier implementation of various online surveys (Sills and Chunyan, 2002). Based on this approach to studying the market, very useful information can be obtained on the willingness of consumers to pay a higher price for traditional products, but also about their interest in new products obtained from genetic resources (Conto et al., 2016).

In an effort to assess consumer interest in the expanded utilization of traditional wheat varieties, genetically modified organisms (GMO) and pesticides, a comprehensive online survey was carried out. The primary aim was to uncover the perception of the public concerning topics related to food choice and to evaluate the potential of reintroduction of traditional varieties in production as one of the solutions for the growing demand for healthy and safe food products in Montenegro.

MATERIALS AND METHODS

In order to determine the perception of public opinion and consumer interest in traditional wheat varieties, GMOs and the use of pesticides, a voluntary self-administered online survey was conducted. The survey was conducted in the period from February 24 to April 4, 2020. Respondents were contacted via e-mail and social networks. In addition to the six questions related to general information, the questionnaire contained an additional 27 questions, related to GMOs and pesticide residues (12 questions), and local varieties (nine questions). It included a combination of one and multiple-choice questions. After an explanatory introduction, the participants were questioned on their perception of the negative effect of GMOs on the environment, animal and human health, GMO labeling, food choice preferences, properties of products from local varieties, choice of bread produced from local or modern varieties, and willingness to pay more for bread produced from local wheat varieties.

The questionnaire was available in the Montenegrin language through Survio website (www.survio.com). Data were analyzed using Microsoft Excel.

RESULTS AND DISCUSSION

Out of 3014 visits, 1178 questionnaires were completed, resulting in 39.1% overall completion rate, indicating a moderately successful engagement with respondents. Table 1 provides the profile of the respondents from a survey, with several demographic categories, including sex, age group, and occupation, along with the corresponding answer choices and the number of responses in each category. A significant majority of the respondents are female (60.61%). The largest age group is 35-44 making up nearly 30% of the respondents, followed by 25-34 (28.1%) and 18-24 (23.43%). The older age groups, 45-54 and 55 and more have a smaller representation (13.92% and 5.18%, respectively). The occupation breakdown provides context for understanding the employment status and potentially the economic perspectives of the survey respondents. The majority of respondents have either a full-time or part-time job (69.86%), followed by students (16.21%). Only 2.55% of participants were retired, while 11.38% were unemployed.

Table 1. Profile of the respondents

Answer choices	Responses	Ratio
Sex		
Male	464	39.39%
Female	714	60.61%
Age group		
18-24	276	23.43%
25-34	331	28.1%
35-44	346	29.37%
45-54	164	13.92%
55 and more	61	5.18%
Occupation		
Full-time or part-time job	823	69.86%
Student	191	16.21%
Unemployed	134	11.38%
Retired	30	2.55%

Respondents' perceptions regarding the negative effects of GMOs on the environment, animal health, and human health were categorized into "yes", "no", and "I don't know" options (Figure 1). A consistent pattern of concern among respondents regarding the negative effects of GMOs was noted. A significant majority of respondents believe that GMOs have negative effects on the environment (69.35%), while a relatively small portion of the respondents, just over 12%, believe that GMOs do not have negative effects on the environment. About 18.34% of the respondents are uncertain about the environmental effects of GMOs, reflecting a degree of indecision or lack of information on the topic. Similarly, the majority of the respondents also believe that GMOs have negative effects on animal health (72.58%). Only a small minority (10.87%) of the respondents believe that GMOs do not negatively impact animal health, while a notable proportion of the respondents (16.55%) are unsure about the effects of GMOs on animal health. The highest overall percentage of respondents believe that GMOs have negative effects on human health (76.83%), indicating a strong concern regarding the potential impact of GMOs on human well-being. A relatively small number of respondents (8.32%) believe that GMOs do not have negative effects on human health, and 14.86% of the respondents express uncertainty about the effects of GMOs on human health, indicating that many respondents lack a clear stance on this issue.

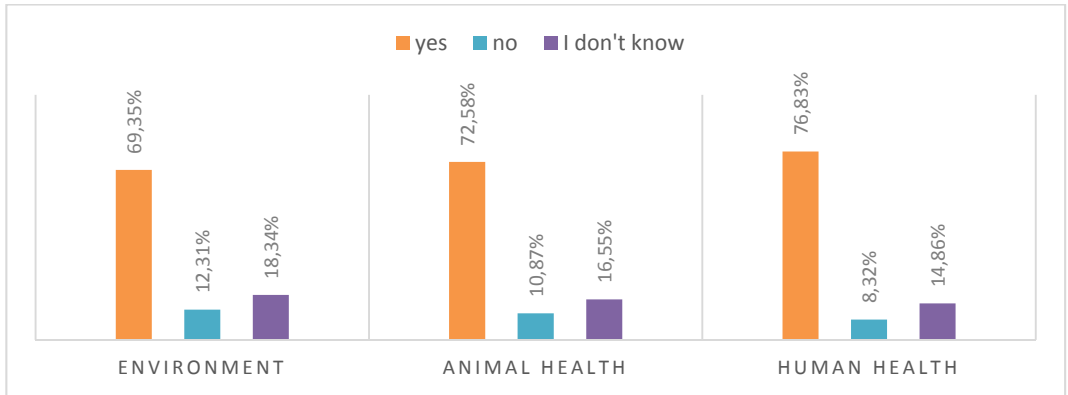


Figure 1. Survey participants’ perception on the negative effects of GMOs on the environment, animal and human health.

A relatively small percentage of the respondents (24.28%) claim that GMOs are labeled, while a slightly higher percentage of the respondents (27.50%) believe that GMOs are not labeled (Figure 2). The most significant portion of the respondents (48.22%) admit that they haven't paid attention to whether GMOs are labeled or not, reflecting a lack of awareness or indifference to labeling practices related to genetically modified products. These findings highlight the need for transparent and standardized labeling practices to ensure that consumers can make informed choices about the products they consume.

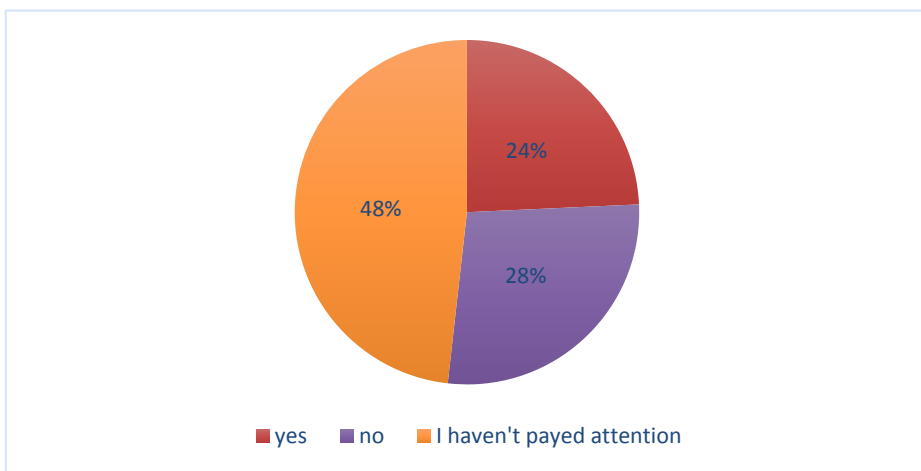


Figure 2. GMO labeling awareness.

Food choices reflect some interesting insights when the survey participants are asked if they would prefer GMO food, food containing pesticide residues, or their own production (Figure 3). A small percentage of the respondents, just over 6%, express a willingness to choose GMO foods. This suggests that some individuals are not averse to consuming genetically modified organisms, perhaps due to a

belief in their safety or other factors such as cost or availability. Even a smaller subset of the respondents (approximately 3.5%) indicate a preference for foods containing pesticide residues. The most significant response is that the majority of the respondents, over 90%, express a preference for producing their own food, suggesting a strong interest in the quality and safety of the food they consume. These findings are valuable insights into understanding the preferences and priorities of individuals when it comes to their food choices and production methods.

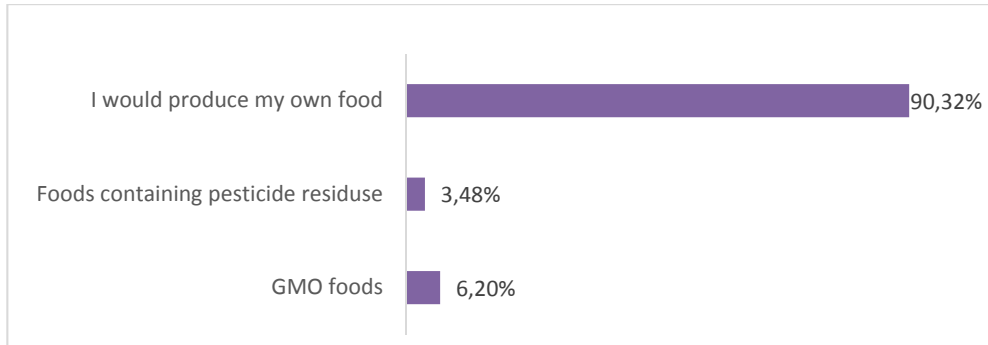


Figure 3. Food choice preferences.

The survey results provided insights into respondents' attitudes and preferences regarding local food products (Figure 4). The most notable characteristic of products from local varieties is taste (79.12%), followed by aroma and smell (55.86%), nutritional value (50%), and finally health benefits (44.82%). The majority of the respondents prefer to buy bread made from local varieties (94.57%) indicating a preference for traditional, local flavors and ingredients. While price sensitivity is a factor for some, a significant portion of the respondents is willing to pay more for products from local varieties. Around 11% of the respondents are not willing to pay more for products from local varieties if the price exceeds the average. This indicates that while many value local products, price sensitivity is a consideration for a segment of the population. Part of the respondents (31.15% and 34.38%, respectively) is willing to pay up to 25% or 50% for products from local varieties indicating a relatively strong commitment to local products. A smaller percentage (10.27%) is willing to pay up to 75% and nearly 19% of respondents are willing to pay 100% or more, emphasizing a high willingness to invest in local products.

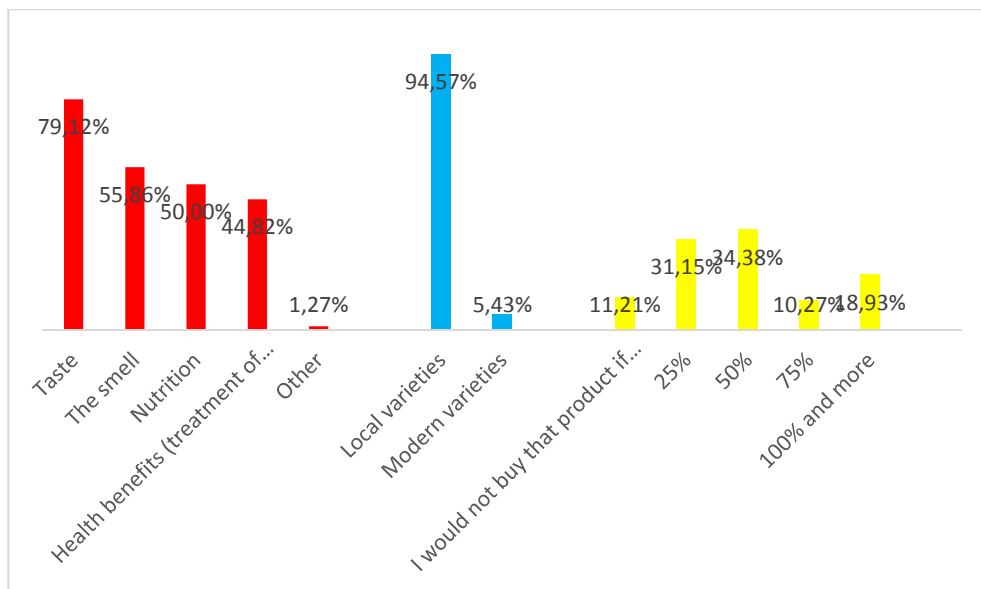


Figure 4. Properties of products from local varieties (red), choice of bread produced from local or modern varieties (blue), and willingness to pay more for bread produced from local wheat varieties (yellow).

CONCLUSION

This survey provides a comprehensive overview of the respondents' perspectives and preferences on perceptions of GMOs, food choices, and attitudes toward local food products. Respondents showed a consistent pattern of concern regarding the negative effects of GMOs on the environment, animal health, and human health. However, the majority of the respondents have not paid attention to GMO labeling, indicating a lack of awareness or indifference. Meanwhile, the survey participants indicated a preference for purchasing products made from local wheat varieties. Moreover, the majority of the respondents are willing to invest in food products with specific attributes, including taste, smell, and nutritional/health benefits. Furthermore, a large majority is willing to spend more on products made from local wheat varieties, emphasizing a growing interest in authentic, locally sourced foods among Montenegrin consumers. As for agricultural production, the survey demonstrated strong support for the use of traditional plant varieties to create authentic, local products. Addressing consumer concerns and preferences for food and agriculture provides valuable insights for producers, policymakers, and the market in understanding and meeting the needs of local and traditional food products in Montenegro.

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