Consumer attitudes and consumption patterns toward functional food bars in Slovakia

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Abstract

Consumers’ eating habits have recently been influenced by changing lifestyles, emphasis on health and sustainability. The globally developing food market emphasizes the consumption of healthy and functional food. Currently, Slovak consumers have the ambition to eat healthier and consume foods with a high content of nutritional components. On the other hand, they look for foods that are a source of quick energy, give strength, satiate and are practical. These functional food bars include for example snack bars, energy bars, protein bars, fruit bars, cereal bars, granola bars, nut bars, sports bars. The aim of the paper was to point out the consumer perception of functional food bars and the behaviour of Slovak consumers when consuming these healthy foods. To achieve the aim of the paper, the consumer survey was conducted by snowball sampling method in 2021 in Slovakia (n=1,138 respondents). The aim of the survey was to examine consumption preferences of cereal, muesli, and protein bars and to identify the key reasons and determinants of the consumption of functional food bars. The collected data were processed and evaluated through mathematical and statistical methods. The results showed that approximately half of Slovak consumers are consumers of functional food bars, while cereal and muesli bars are the most consumed. The survey showed that the key reasons for consumption are taste, health aspect and energy replenishment. The content of proteins, fibre, vitamins, and minerals are the most important determinants of choosing and consuming functional food bars. Based on the results of the survey, it is possible to state that 66% of Slovak consumers will not change consumed amount of functional food bars, and 28% of Slovak consumers plan to increase their consumption of healthy functional foods in the future. It follows that it is desirable to consume functional food bars due to their health aspect, nutritional composition, and convenience. The consumer study provides an insight into the behaviour of Slovak consumers when consuming functional food bars, with an emphasis on cereal, muesli, and protein bars, and becomes a suitable basis for the scientific and research sphere, as the issue of consuming functional food bars has not yet been solved in Slovakia. The study also provides information for business enterprises, which should expand the range of functional food bars and develop new innovative functional food bars containing various flours rich in proteins, vitamins, and minerals in view of the growing consumer demand. The study can also be beneficial in the creation of food policy, or in raising consumer awareness of the health benefits of consuming functional food bars.
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JEL Classification: Q13, M31, M39

1. Introduction

Nowadays, the trend in the food market is the preference of consumers towards healthy foods, which are easy to consume, store and handle (Constantin & Istrati, 2019; Singh, Kumari & Chauhan, 2022). Functional food bars meet changing consumer requirements related to health-promoting and convenient products (Kosicka-Gębska, Jeżewska-Zychowicz, Gębski, Sajdakowska, Niewiadomska & Nicewicz, 2022). These bars are often produced foods with content of cereals, fruits and nuts, which are a significant source of healthy nutrients, bioactive compounds and fiber (Constantin & Istrati, 2019). Food bars are most often made based on cereals, such as oats, rice, corn or the basis of proteins (dairy milk proteins, soy or whey). These foods are enriched with vitamins, minerals and other ingredients rich in nutrients or energy, and are becoming a popular functional food.

Many studies differ in the definitions and formulations of food bars. The most famous types are fruit bars (Sun-Waterhouse, Teoh, Massarotto, Wibisono & Wadhwa, 2010; Orrego, Salgado & Botero, 2013), wheat or soy based bars (Aramouni & Abu-Ghoush, 2010; Qin, Wang, & Luo, 2022; Lu & Zhou, 2019), cereal bars (Aleksejeva, Siksn & Rinkule, 2017), fruit and vegetable bars (Da Silva, Siqueira, Do Lago, Rosell & Vilas Boas, 2013), vegetable bars (Ferreira, Santos, Moro, Basto, Andrade & Gonçalves, 2013) or high-protein bars and protein energy bars (Hogan, Chaurin, O’Kennedy & Kelly, 2012; Szydłowska, Zielińska, Łepecka, Trząskowska, Neffe-Skocińska & Kołožyn-Krajewska, 2020; Jabeen, Huma, Sameen & Zia, 2021).

However, in general, it can be stated that the bars are consumed by consumers from all over the world (Srebernič, Gonçalves, Ormenese & Ruffi, 2016) because they provide instant energy (Zulaikha, Yao & Chang, 2021). In addition, Kowalska, Kowalska, Ignaczak, Masiarz, Domian, Galus, Ciurzyńska, Salamon, Zajac, and Marzec (2021) add that consumers are oriented towards light meals, have a lack of time to prepare and consume traditional meals, but are interested in eating healthy. According to Ferreira, Pontes and Rodrigues (2007), bars are suitable for consumption, and the key motive for consumption is a practical and convenient way of nutrient intake. Bars are therefore preferred by consumers due to their high content of fiber, vitamins, and minerals, the consumption of which can prevent various diseases such as obesity, cancer, and diabetes. The consumption of functional bars is mainly preferred by consumers who are on a diet, have health problems, or are looking for a quick snack (Farinazzi-Machado, Barbalho, Oshiiwa, Goulart & Pessan Junior, 2012; Zaveri & Drummond, 2009). Constantin & Istrati (2019) state that functional bars can be consumed as part of a meal, as a dessert, or as a meal replacement. The consumption of functional bars is also often associated with consumers who engage in sports activities (Hogan et al., 2012; Jovanov, Sakač, Jurdana, Pražnikar, Kenig, Hadnađev, Jakus, Petelin, Škrobot & Marić, 2021), or consumers who perceive functional bars as a substitute for sweets and candies (Da Silva et al., 2013). This is also confirmed by Aleksejeva et al. (2017), who state that consumers primarily prefer cereal bars, which they choose as an alternative to the less-healthy snacks, a quick source of energy before a workout, or a substitute for a meal. Constantin and Istrati (2019) summarized that the food bars consumption is influenced by satisfying the need for sweets; saving time; using as an energy source; using for weight loss; and using for the protein, fiber, vitamin contents, etc.
In the context of the mentioned the aim of the paper is to point out the consumer perception of functional food bars and the behaviour of Slovak consumers when consuming these healthy foods. Based on the aim of this paper, the following research questions were formulated:

1. Which functional food bars are most preferred among Slovak consumers?
2. What are the reasons for functional food bars consumption?
3. What are the key determinants of functional food bars consumption?

2. Data and Methods

Consumer study is based on questionnaire survey aimed to consumption functional food bars, consumption frequencies of individual functional food bars, consumer preferences of functional food bars, as well as to identifying key reasons and composition factors affecting functional food bars and future perspectives related to consumption patterns toward functional food bars. The consumer survey was conducted in the Slovak Republic in 2021 by snow-ball method. The sample of respondents consisted of 1138 consumers, of which 594 were consumers of functional bars. Respondents were divided according to the following socio-demographic characteristics, namely gender, age, education, place of residence, economic activity, personal net income per month (Table 1).

**Table 1: Socio-demographic profile of the sample**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total sample</th>
<th>Sample of functional bars consumers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n) (%)</td>
<td>(n) (%)</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>482 (42.4%)</td>
<td>223 (37.5%)</td>
</tr>
<tr>
<td>Female</td>
<td>656 (57.6%)</td>
<td>371 (62.5%)</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 – 24 years</td>
<td>469 (41.2%)</td>
<td>297 (50.0%)</td>
</tr>
<tr>
<td>25 – 40 years</td>
<td>199 (17.5%)</td>
<td>104 (17.5%)</td>
</tr>
<tr>
<td>41 – 56 years</td>
<td>327 (28.7%)</td>
<td>149 (25.1%)</td>
</tr>
<tr>
<td>More than 56 years</td>
<td>143 (12.6%)</td>
<td>44 (7.4%)</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary</td>
<td>38 (3.3%)</td>
<td>22 (3.7%)</td>
</tr>
<tr>
<td>Secondary</td>
<td>905 (79.5%)</td>
<td>481 (81.0%)</td>
</tr>
<tr>
<td>Higher education</td>
<td>195 (17.1%)</td>
<td>91 (15.3%)</td>
</tr>
<tr>
<td><strong>Place of residence</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>643 (56.5%)</td>
<td>335 (56.4%)</td>
</tr>
<tr>
<td>Urban</td>
<td>495 (43.5%)</td>
<td>259 (43.6%)</td>
</tr>
<tr>
<td><strong>Economic activity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>484 (42.5%)</td>
<td>228 (38.4%)</td>
</tr>
<tr>
<td>Student</td>
<td>412 (36.2%)</td>
<td>267 (44.9%)</td>
</tr>
<tr>
<td>Self-employed</td>
<td>79 (6.9%)</td>
<td>41 (6.9%)</td>
</tr>
<tr>
<td>Unemployed</td>
<td>27 (2.4%)</td>
<td>15 (2.5%)</td>
</tr>
<tr>
<td>Retired</td>
<td>112 (9.8%)</td>
<td>32 (5.4%)</td>
</tr>
<tr>
<td>Maternity leave</td>
<td>9 (0.8%)</td>
<td>2 (0.3%)</td>
</tr>
<tr>
<td>Other</td>
<td>15 (1.3%)</td>
<td>9 (1.5%)</td>
</tr>
<tr>
<td><strong>Personal net income per month</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up to 400 €</td>
<td>411 (36.1%)</td>
<td>255 (42.9%)</td>
</tr>
<tr>
<td>401-600 €</td>
<td>145 (12.7%)</td>
<td>56 (9.4%)</td>
</tr>
<tr>
<td>601-800 €</td>
<td>158 (13.9%)</td>
<td>81 (13.6%)</td>
</tr>
<tr>
<td>801-1,000 €</td>
<td>188 (16.5%)</td>
<td>93 (15.7%)</td>
</tr>
<tr>
<td>More than 1,000 €</td>
<td>236 (20.8%)</td>
<td>109 (18.4%)</td>
</tr>
</tbody>
</table>

Source: questionnaire survey
Consumers involved to the questionnaire survey determined consumer preferences of individual functional food bars and their consumption frequencies. Differences between consumption patterns between individual consumer groups of consumers in terms of socio-demographic characteristics were identified using Chi square test of independence.

Respondents who consume functional food bars evaluated reasons of consumption on a 5-point Likart scale, with 1 representing the least important reason and 5 representing the most important reasons. Consumers determine significance of eight different reasons, namely replacement of one meal a day, slimness and beauty, practical reasons, substitute for wafer biscuit/cookies, source of protein, energy source, health aspect and taste. Differences among the examined reasons of consumption were analysed using Friedman test and consequent post hoc pairwise multiple comparison test according to Nemenyi.

The aim of survey was to identify key composition factors affecting purchase and consumption of functional food bars. Consumers evaluated thirteen factors related to composition on a 5-point Likart scale, with 1 representing the least important factor and 5 representing the most important factor. A deeper analysis aimed at identifying the differences between these factors was also carried out using the Friedman test and the Nemenyi method.

Using statistical methods in the XLStat and IBMSPSS programs, we evaluated consumer attitudes and consumption patterns towards functional food bars in Slovakia.

### 3. Results and Discussion

The results of the consumer survey show that more than 50% of Slovak respondents are consumers of functional food bars. We also identified that 16.6% of Slovak consumers of functional food bars consume them several times a week and 18% of these consumers consume bars once a week. Survey also showed that two thirds of consumers consume functional food bars occasionally or once a week.

Research was oriented on the consumer preferences of the functional food bars. Based on the results it could be stated that cereal bars and muesli bars are the most consumed. Muesli bars are consumed by approximately 40% of Slovak consumers at least once a week. Cereal bars are less consumed and about third of consumer consume them once a week or more often. The least consumed are protein bars and results show that more than 70% of Slovak consumer consume them occasionally or they do not consume at all. Consumption frequencies of functional individual food bars are stated in the table 2. In the context of functional bars consumption in the Slovak Republic we identified differences in consumption between individual consumer groups of consumers in terms of socio-demographic characteristics. Based on the results of Chi square test of independence (p-value = <0.05) we found that younger consumers and consumers with higher income tend to consume mainly cereal bars. Further finding was that protein bars are preferred mainly by men, younger generation, university educated and consumers with higher income.

### Table 2: Consumption frequency of functional food bars

<table>
<thead>
<tr>
<th>Consumption Frequency</th>
<th>Muesli</th>
<th>Cereal bars</th>
<th>Protein bars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Several times a week</td>
<td>19.0 %</td>
<td>11.8 %</td>
<td>10.6 %</td>
</tr>
<tr>
<td>Once a week</td>
<td>19.5 %</td>
<td>21.7 %</td>
<td>15.5 %</td>
</tr>
<tr>
<td>Once a month</td>
<td>48.2 %</td>
<td>52.7 %</td>
<td>37.4 %</td>
</tr>
<tr>
<td>No consumption</td>
<td>13.3 %</td>
<td>13.8 %</td>
<td>36.5 %</td>
</tr>
</tbody>
</table>

Source: questionnaire survey
The next aim of survey was to identify reasons of functional food bars consumption. Consumers evaluated 8 reasons for consumption on a scale from 1 to 5, with 1 being the least important reason and 5 being the most important reason. The results showed that consumers consider taste and health reasons as key ones for functional food bars consumption. We also identified differences in the evaluation of the reasons which were confirmed by applying the Friedman test \( \text{p-value} = <0.001 \). Consequent post hoc pairwise multiple comparison test according to Nemenyi groups the examined reasons according to differences between mean of ranks. Differences among reasons for consumption of functional food bars are shown by Demsar plot (Figure 1).

**Figure 1: Reasons for consumption of functional food bars**

![Figure 1: Reasons for consumption of functional food bars](image)

Source: questionnaire survey

Questionnaire survey was aimed at identifying composition factors affecting consumption of functional food bars. Slovak consumers evaluated 13 different ingredients of functional bars on a 5-point scale, with 1 being the least important composition factor and 5 being the most important composition factor. Based on the results of the survey it could be concluded that the most significant factors related to composition are energy value, content of proteins, fibre, vitamins, as well as the lowest content of sugar. Differences between examined composition factors were also analysed using the Friedman test and we identified differences \( \text{p-value} = <0.001 \). Table 3 shows the results of using Nemenyi method and points out the means for individual composition factors and based of which these factors are grouped. In addition, the results of Nemenyi’s method are presented graphically using the Demsar plot (Figure 3).

**Table 3: Results of Nemenyi’s method: Differences among examined composition factors**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Frequency</th>
<th>Sum of ranks</th>
<th>Mean of ranks</th>
<th>Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lactose free</td>
<td>594</td>
<td>2676,000</td>
<td>4,505</td>
<td>A</td>
</tr>
<tr>
<td>Taurine</td>
<td>594</td>
<td>3062,500</td>
<td>5,156</td>
<td>A, B</td>
</tr>
<tr>
<td>L-carnitine</td>
<td>594</td>
<td>3325,000</td>
<td>5,598</td>
<td>B</td>
</tr>
<tr>
<td>Flavour (e.g. yogurt topping)</td>
<td>594</td>
<td>4028,500</td>
<td>6,782</td>
<td>C</td>
</tr>
<tr>
<td>Collagen</td>
<td>594</td>
<td>4160,000</td>
<td>7,003</td>
<td>C</td>
</tr>
<tr>
<td>Minerals</td>
<td>594</td>
<td>4778,500</td>
<td>8,045</td>
<td>D</td>
</tr>
<tr>
<td>Carbohydrates</td>
<td>594</td>
<td>5004,000</td>
<td>8,424</td>
<td>D, E</td>
</tr>
<tr>
<td>Vitamin B</td>
<td>594</td>
<td>5034,000</td>
<td>8,475</td>
<td>D, E, F</td>
</tr>
<tr>
<td>Sugar</td>
<td>594</td>
<td>5070,000</td>
<td>8,535</td>
<td>D, E, F</td>
</tr>
</tbody>
</table>
The last part of consumer survey was oriented on the future consumption. Results show that 70% of Slovak consumer will not plan to change consumption of functional bars. Positive finding was, that more than 25% of Slovak consumer will plan to increase consumption and only 2% of consumers will plan to consume fewer functional food bars compared to current consumption.

The results of a consumer study in Slovakia showed that approximately half of consumers consume functional bars, and cereal and muesli bars are the most preferred. Furthermore, we identified the need to obtain quick energy, the health aspect and the taste of bars as key reasons for consuming these foods. In addition, energy value, fiber and protein content are decisive for consumers when choosing functional bars. Consumer studies focused on snack bars, cereal bars, fruit bars or protein bars were also carried out in other countries. According to Brazilian consumer study, the most consumed food bars were fruit and cereal bars. Protein and nut bars may be more attractive only if they would be offered for affordable prices (Pinto, Oliveira Freitas, Melo, Freitas, Souza Araújo, Minim, de Souza & Bressan, 2018). Another study indicated that cereal and fruit bars are consumed by majority of respondents 1 or 2 times per week. The primary reason for consumption were possible positive effects, nutritional value or simple desire for sweet taste (Kosicka-Gębska et al., 2022). Based on the research elaborated by Perkovic, Otterbring, Schärli, and Pachur, (2022), it can be stated that
higher fiber content and healthy perception of fruit inside of bars were the main reason for consumer acceptance. In this context, Forbes, Kahiya and Balderstone (2015) emphasize that sugar and total fat are the most important nutritional factors for consumer decision-making purchases of food bars. In addition, level of knowledge related to nutrition and demographic variables such as gender and age have certain impact on overall consumption of snack bars. (Constantin & Istrati, 2019).

4. Conclusion

To conclude the functional bars market will grow significantly in the coming years. A growing health-conscious population across the globe has shown increasing preference towards the consumption of different types of functional bars available in the market. The growth is mainly driven by the trend of population obesity and also an increasing inclination of people towards weight loss. The most preferred functional bars are energy bars, protein-rich bars, meal replacement bars and low carbohydrate bars. As these functional food bars are very healthy we conducted questionnaire survey and its results showed that in Slovakia more than 50% consumers consume functional bars and the most consumed functional bars are muesli and cereal bars. Interesting finding was that protein bars are preferred by younger generation, men, employed consumers with higher income. We identified key reasons for consumption which are taste, health and energy source. Slovaks prefer bars with high energy value, high protein, fiber, vitamin content and reduced sugar content. In the future 70% Slovaks will not plan to change functional bars consumption, and moreover more than 25% will plan to increase their consumption. Based on the results of the consumer study and the situation on the functional food bars market, it is desirable for Slovak consumers to be motivated for consumption of functional bars. Furthermore, we suggest to consumer awareness of functional bars and inform and educate consumers about healthy and functional food. We also suggest to appeal to food enterprises and initiate them to develop and produce new functional bars containing various flours rich in proteins, vitamins, and minerals in view of the growing consumer demand. In the future research it is necessary to monitor trends in the functional bars market and to examine motives and barriers of consumption in other countries.

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