 doi:10.20944/preprints201801.0258.v1

Article

Assessment the Region's Sustainability through Quality Labels for Small Farmers' Products. Slovak Case Study

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Abstract: Regional product labeling can help develop regional business activities, especially with traditional regional products. Their general popularity is a significant source of income for the less developed regions. The Gemer-Malohont region belongs to economically underdeveloped areas with high unemployment rate. The subject of the survey was regional food products, which are made by small farmer. The analysis was carried out on a questionnaire survey in the period April-July 2017 in each of the region's districts. The results obtained by questionnaire survey have been statistically processed using the statistical method (two-step cluster analysis, radar chart, box-plots, regression analysis) using Microsoft Excel and IBM SPSS Statistics 23 software. Through cluster analysis and based on the preference of regional food, we divided consumers into two groups - knowledgeable regional food purchasers and priced oriented consumers. We have shown that the more developed regions (Rimavská Sobota, Rožňava) show a higher rate of purchase of regional foods. Less developed regions (Poltár, Revúca) are represented by lower-income consumers for whose the food price is the decisive criterion. Local residents of backward regions should pay attention to domestic food and local small farmers, who are the way to create local capital and local development.

Keywords: local activities, regional products, sustainability support

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1. Introduction

An integral part of the European Union's cohesion policy is an effort to improve the quality and safety of domestic products. A large number of domestic products show specific characteristics related to their geographical origin, traditional production, use of traditional raw materials or other qualitative benefits [1]. These characteristics have an impact on consumer product perception and purchasing decisions and support for the development of the regional economy. Velčovská and Sadílek [2] judge the growing interest of consumers in European Union countries into both quality and traditional products. Over the last few decades, consumer consumption of goods and services has increased dramatically across the world. This has led to diminished natural resources and severe harm to the environment, such as global warming, expanded environmental pollution and declines in flora and fauna [3].

The idea of branding products with brands that inform the consumer about the impact of products, their production and consumption on the environment was first implemented in Germany in 1978 [4]. At present, the Ecolabel program covers the labeling scheme of environmentally suitable products. Such products can obtain an EU Ecolabel that informs the consumer and at the same time certifies that the product meets the requirements for the elimination of direct and indirect environmental impacts, population health and species biodiversity and ecosystems [5,6].

Among the indicators of economic development, the Slovak Republic is based on OECD data from 2014 among the countries with the largest regional differences in income indicators (29th among 32 countries) and non/employment (21^{st} out of the 33 surveyed countries). This is caused mainly by

 doi:10.20944/preprints201801.0258.v1

the high distance of the capital (Bratislava) from the rest of Slovakia. Differences exist in the level of income of individual regions and the lag of the regions of Eastern and Southern Central Slovakia (Table 1) in the unemployment rate. [7]

In 2015, the Slovak Republic adopted Act No. 336/2015 Coll. [8] on the support of the least-developed districts. The law identified the 12 least developed districts in the SR (Figure 1). The Gemer-Malohont region belongs to that group of districts. Goliaš [7] reports the highest unemployment rate over 20% (in March 2017) of the districts of Rimavská Sobota, Revúca and Rožňava. This fact must be reflected in the monitored parameters such as the amount of monthly income and the purchasing power of the population. The "poverty rate" factor is monitored in the mentioned regions (Table 1).

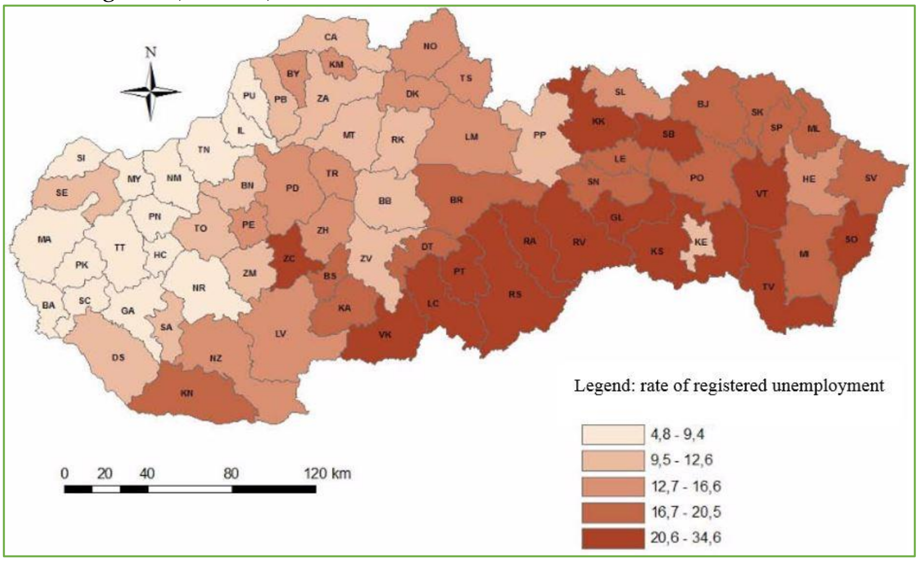

Figure 1. Registered unemployment rate [%] in the districts of the SR in 2011.

The presented poverty rate by districts of Slovakia was determined on the basis of the Michálek and Veselovská study [9]. Michálek and Veselovská [9] assigned to the districts the degree of risk of poverty rate in 2001 and 2011. Measures were indicators such as unemployment, low education, family size, incomplete families, etc. The resulting numerical evaluation of the district fell to one of the ranges marked with numbers from 1 to 5, 1 being the smallest and 5 highest risk degree of poverty rates. Other indicators were the unemployment rate and the average wage in the individual districts as well as the share of the Roma population. Data on the Roma population are from the Atlas of the Roma Communities of the Ministry of the Interior [10].

Table 1. Districts according to indicators of the living standard and share of the Roma population.

District	Region[1]	Unemployment Rate (March 2017, v %)	Average month income (2014, v EUR	Index of poverty (1-5)	Share of Roma population (in %)
Rimavská Sobota	BB	24.65	684	8	28.24
Revúca	BB	21.83	770	5	31
Rožňava	KE	20.59	867	5	22.63
Poltár	BB	17.02	713	4	11.07

[1] BB – Banská Bystrica Self-Governing Region, KE – Košice Self-Governing Region.

Typography of poverty of districts by Michálek et al. [11] includes Rimavská Sobota and Revúca between the type of Roma poverty [9,12]. Despite the high poverty rate, they are areas with high

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potential for regional resources thanks to the development of agriculture. The production of domestic raw materials opens up for food and other agricultural regional products.

The aim of the article is to provide a consumer survey of local consumers' opinions on the regional environmental labeling of Gemer-Malohont, Slovakia. The questionnaire survey observed the knowledge of respondents about regional labeling and the factors affecting the purchase of regional foods. Innovation of the given paper is the presentation of one of the most distant regions of the Slovak Republic and a demonstration of the potential of its regional development.

1.1. Theoretical background

Environmental labeling is a voluntary instrument of environmental policy. Its use supports the development of regional activities and contributes to raising the standard of living. [13] Ecolabels are intended as a means for consumers for sustainable consumption. The aim of ecolabels is, as stated by Clancy, et al. [14], to help consumers identify products that have a relatively low impact on the environment throughout their lifecycle. E.g. The Ecolabel Index 2017 [15] contains a list of 465 ecolabels in 199 countries and 25 industries. Buckley [16] considers ecolabels as a consumer choice component.

The International Organization for Standardization (ISO) has structured and classified environmental labels in three types that correspond to the three communication channels according Fracoisa-Lecomptea, et al. [17]: type I ecolabels (certified by third party according to ISO 14024), type II ecolabels. (custom environmental declarations on packaging according to ISO 14021), type III ecolabels. (own environmental statements according to ISO 14025). Ecolabel's type I and II. help consumers identify so- honest eco products. Type II Ecolabel contains unclear information that makes it difficult for consumers to understand the impact of the product on the environment.

Environmental product labeling is seen as a tool to increase demand for eco products, which leads to a reduction in the environmental impacts of production. We integrate it between marketing eco-innovation. It offers information on the quality and performance of products in terms of their impact on the environment throughout their life cycle (Life Cycle Assessment). Ecolabels, according to Baumeister and Onkila [18], should bring a change in consumer behavior and contribute to environmental awareness. Ecological consumers are usually associated with environmentally responsible consumption, which takes into account the environmental impact of purchasing, using and disposing of different products [3]. For this purpose, studies mapping positive changes in customer behavior within various industrial sectors, were created studies: automobile industry [19], production of white and black technique [20], coffee production [21], and the production of coffee [19], wine production [22]. There are also studies challenging these positive changes in consumer behavior [23,24,25,26].

The food industry is one of the key sectors in which the high weight of ecolabels is attributed. Eco-branded food products account for 5% of sales in Europe [27]. The total share of eco-labeled products is low on the market. The food sector has been identified as one of the segments in which the green market has continued to grow. Growth of other sectors was interrupted [28].

In recent years, regional labeling of products (especially food) has begun to develop more strongly in European countries in the context of product environmental labeling. Thanks to the careful use of natural resources in the area, the consumer, by purchasing these products, contributes to the protection of the environment, supports the economic development of the area and helps to restore the lives of the rural population [29]. Traditional food products are an important element of European culture, identity and heritage, which contribute to the development and sustainability of rural areas and protect them from spoilage. They offer consumers a wide range of choices associated with regional identity and sensory quality [30]. They are sold under different trademarks. Small farmers face a challenge to further improve the safety, health and quality of their products through various innovations that will enable them to maintain and expand their market share [31,32].

According to Štensova [33], regional brands in Slovakia are branded by labelling with approximately 10 years of history. Local Action Groups have been involved in creating and promoting regional brands. All regional brands in Slovakia have their own website, the uniform appearance of the logotype expressing the symbol typical of the region.

The Regional Marking of GemerMalohont products was introduced in 2014 by the MALOHONT Local Action Group [34]. Products come from a local manufacturer, using traditional practices or local natural resources, contain a certain amount of manual work and are unique in relation to the region. Products from the region that have been branded "GEMER-MALOHONT® regional product (Figure 2)" are fruit juices, goat's milk, ceramics, woven products, meat and meat products, home-made horseradish, honey, bee hives, cosmetics, wire and wood products, hand-embroidered pictures.

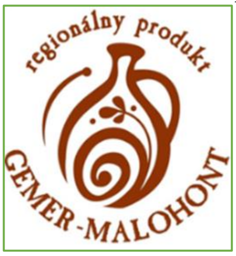

Figure 2. Logotype of the regional brand Gemer-Malohont [34]

GEMER-MALOHONT® regional label is aimed at distinguishing, highlighting and supporting local producers and service providers who, in addition to their production and services, are also involved in job creation, building the region's good name, and preserving its traditions, values and uniqueness. A regional label designating local products or services will guarantee consumers the origin of the product or service in the region, as well as the use of traditional practices or local, regional resources.

2. Materials and Methods

The study aims to analyze and assess the opinion of the consumers on the regional branding in selected region in Slovakia. The subject of the survey was regional food products, which are made by small farmer. The analysis was carried out on the basis of original empirical research which is based on a questionnaire survey. The survey was conducted in the period April-July 2017 in each of the region's district. The results obtained by questionnaire survey have been statistically processed using the statistical method of quantitative and qualitative character analysis using Microsoft Excel and IBM SPSS Statistics 23 software.

The consumer survey was attended by 150 respondents. The representative of the selected sample is guaranteed by respecting the geographic location and the gender. In order to verify the representativeness of the sample, we used the nonparametric chi-squared test. According the results of the test, we can say that the sample is representative by the region (p-value = 0.848) and by gender (p-value = 0.573).

Using the two-step clustering, we determined the segment of consumers, who do or don't purchase the regional food products. Firstly, descriptive analysis was performed, followed by a cluster-analysis. Two-step cluster analysis represents method that requires only one pass throughout the data. The process consist of two major steps: first step, where initial clustering of observations into small sub-clusters is performed and further on these sub-clusters are treated as separate observations. The second step is groping, where the sub-clusters are bases for the analysis, and they are grouped into the required number of cluster [35]. In the cluster analysis we used the following quantities: purchase of home product, purchase of regional product, knowledge of regional branding and composition of the product.

Another method was radar chart, which is a graphical method of displaying multivariate data in the form of a two-dimensional chart of three or more quantitative variables represented on axes starting from the same point. The values for adjacent variables in a single series are connected by lines, and, frequently, the polygonal shape created by these lines is filled with a color. We used the same values as with two-step cluster method.

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The food consumption expenditure by district was displayed through box-plots. Food consumption expenditure refers to the monetary value of acquired food, purchased, including only expenditure to regional food products. Than we have approached the relationship between monthly income and food consumption expenditure. We used the regression analysis. The Regression Analysis is a statistical tool used to determine the probable change in one variable for the given amount of change in another one. The degree to which the variables are correlated to each other depends on the Regression Line. The regression also speaks about the relationship between the two or more variables.

2.1. Selection of surveyed area

The territory of Slovakia is full of natural values and attractive phenomena of cultural and social heritage. Economically interesting areas have been and are the center of attention of both professionals and the public. The southern part of Central Slovakia remains on the edge of this interest. The turbulent changes of the 1990s have reduced the share of industry, paralyzed the agricultural system and caused an increase in the unemployment rate. In the whole area there are few settlements (centers), relatively low population and poorly developed network of communications. Hilbert et al. [36] highlighted the prevailing of mono-functional and trifunctional use of land (agriculture, forestry, and mining), industrial production of regional, or local character, with extensive transport and recreational use of the landscape. The current situation is comparable to the above mentioned characteristic and the potential of the country's development should be oriented to its own regional development and the use of regional products and the promotion of modern elements of agro tourism.

The Gemer - Malohont region is located in the central part of Southern Slovakia (at that time part of Banská Bystrica Self-Governing Region). There are parts of Slovak Rudohorie, Rimavská kotlina, Rožňavská kotlina and part of Slovak Kras. The region is rich in mineral resources, natural beauty, with varying flora and fauna, with protected natural areas (surrounded by Protected Country Area - Cerová Vrchovina and National Park - Muránska Planina). Gemer - Malohont is currently one of the most remote regions. The agriculture is developing thanks to the quality of land and climate. The inhabitants of the Gemer region have a rich cultural heritage, preserve their cultural traditions, but are also open to modern culture.

The area is also suitable for the development of industry and agriculture, but on the basis of geographical, natural and cultural determinateness applies more tourism, hiking, agro-tourism (according to SARIO it is the region with the highest amount of protected areas) and other commercial and economic activities, such as awarding regional quality labels. Its industrial base is represented mainly by food factories (Brewery and Malting Gemer s.r.o., R.S.k s.r.o.- Cannery, Meat Industry - TAURIS a.s.).

3. Results and Discussion

The Gemer-Malohont region, as mentioned in the introduction, shows a high rate of unemployment. The high unemployment rate in the region was reflected in the monthly mäsopriemyselincome of respondents. The prevalence (37%) was represented by respondents with monthly income ranging from 351-500 EUR. There was almost the same percentage reported for single (51%) and birth / married respondents (49%) in the research sample. There was a slight predominance of respondents with 2 children (38%) with permanent residency in rural areas (55%).

Through cluster analysis (method of two-step clustering), we identified consumer groups in terms of their preference for regional foods. Based on the proposed segmentation criteria (buying domestic food, purchasing of regional foods, awareness of regional labeling, food composition), we identified two clusters with a satisfactory quality of aggregation in the sample (Figure 3).

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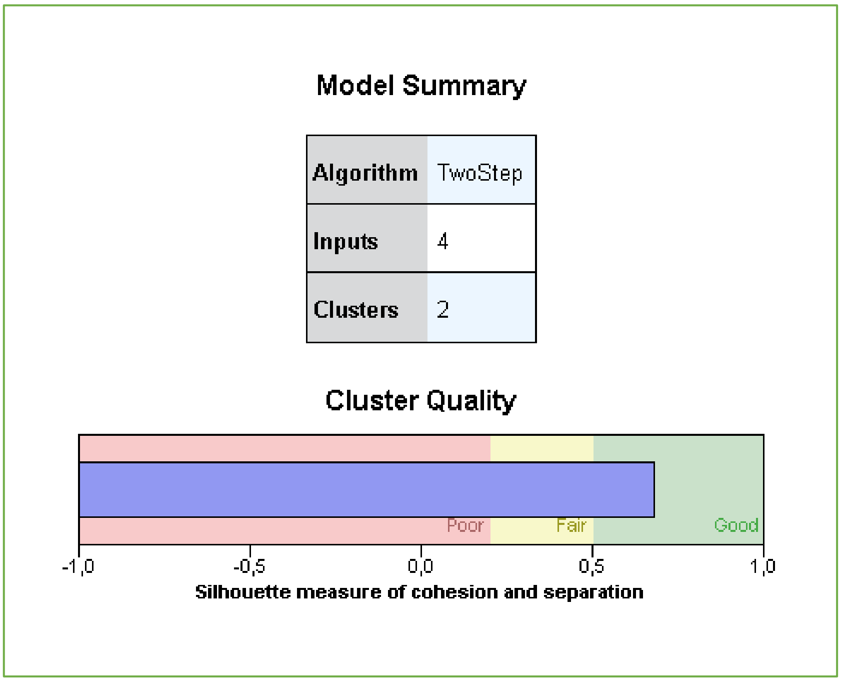


Figure 3. Two-step clustering method - quality of clustering

In terms of Schumacher [37], we can divide consumers into two groups that match our cluster results. The first cluster (Table 2) represents regional branded consumers who have knowledge of regional labeling and therefore focus on buying domestic and regional food. These are individuals of a predominantly female sex (68.3% of women) of working age (26-61 years) who are employed (75.0%) with a monthly income of between 350 and 750 EUR. It has confirmed thesis of Chalupová et al. [38] that women pay more attention to food labels and prefer home-grown food. The finding documents several studies on demographic characteristics of consumers [39-42], which identified the so-called green consumers: women, younger people with higher education, and with higher monthly incomes. In terms of education, the first cluster is remarkable for the representation of consumers with 3rd grade education (66.7% of all third-grade graduates). In this cluster are also concentrated child-free consumers (35.0%). Dominant representation is reported by consumers from the Rimavská Sobota district (61.7%) with a slight prevalence of rural areas (53.3%). Rimavská Sobota, in the Gemer-Malohont region, is a strategic business hub.

Table 2. The labels meaning for the clusters

	Cluster 1	**Cluster 2**
Relative share of cluster	57.7%	42.3%
Regional labelling in shops	52.9%	60.0%b
Regional labelling public event	91.1%	64.1%b
Knowledge of regional labelling	100%	63.6%b
Product price	61.7%	
Buying a specific product	58.3%	65.9%
Repeat purchase of regional labelling	98.3%	84.1%
Travel for the product	60.0%	86.4%

Each underwritten letter (a, b) shows a answer: a = yes, b = no. There are written the predominant answers.

Consumers of the first cluster belong to knowledgeable regional food purchasers (100.0% have knowledge of regional product labeling) for whom the composition of food is above the price. According to Gracia and de-Magistris [43], food labels are a guarantee of food quality and safety. There are emerging studies about the meaning and interpretation of information on the food

doi:10.20944/preprints201801.0258.v1

packaging from the viewpoint of consumers that highlight the non-transparency of information on labels [44,45,18]. According to the Flash Eurobarometer [46], only 7.0% of consumers believe that the food labels provide sufficient and comprehensible information, and almost 32.0% opposed this belief. In our research, the composition and price were a balanced factor in the purchase of regional foods.

Consumers of the first cluster are buying regional foods mostly at public events (91.1%). We have confirmed Fernández-Ferrín et al. [47] claim that these products are sold through short chains, i.e., shop from the yard, which guarantees the unique nature of the origin of the food and the way of production. More than half of consumers (58.3%) buy specific foods and prefer re-purchase (98.3%). These consumers are considered to be the most important source of information as personal experience (46.7%), and do not even trust television advertising (1.7%). Personal experience was one of the most important forms of gathering information on regional foods in the whole research sample (Figure 4). Zenetti, Klapper [48] state that consumers are less dependent on advertising if they have sufficient brand experience, or with manufacturers. On the other hand, TV advertising according Frison et al. [49] belongs, on the producer's side, to the most popular marketing tools (for the year 2012, the share of ad sales on food sales was 9.2%). We are inclined to Zenetti Klapper's [48] opinion, that advertising affects decisions to buy food, depending on the heterogeneous perception of consumers.

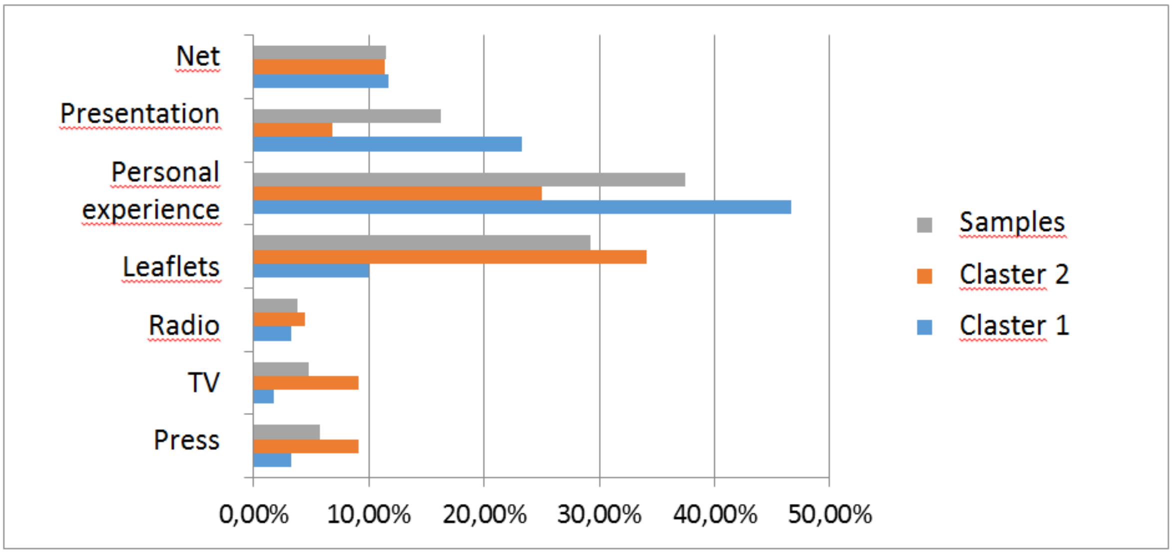
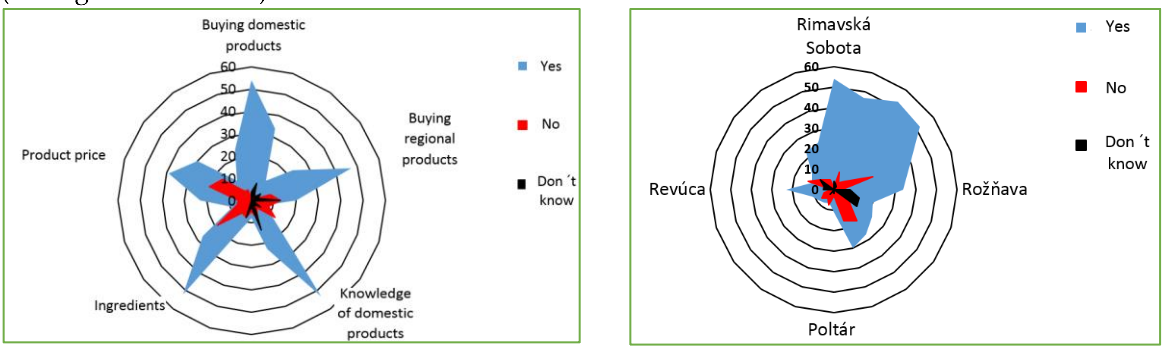


Figure 4. Forms of information about regional products, expressed in%

The second cluster is the so-called priced consumers who do not buy regional foods (Table 2). Up to 56.8% of them are men of working age (26 - 61 years) with the prevalence of secondary education (61.4%). We take the view of Schumacher [37], Chalupová et al. [38] that men buy less of regional products, because a large part of these products are food and men buy more often technique. In this cluster, students, unemployed and retirees have the largest representation in their groups (over 60%). Rural respondents (61.4%) with a larger family (3 or more children) predominate slightly with a monthly income of up to 550 EUR (29.5%). From the point of view of the region, consumers in the Poltár and Revúca district are concentrated in this cluster.

All consumers of the second cluster have no knowledge of regional labeling (100.0%) and therefore do not search for food (60.0%) or public events (40%). The decisive factor in the purchase of food is the price (75.0%). Based on the assumption of Srinivasan, Blomquista [50] that regional foods are associated with so-called premium prices and therefore consumers of this cluster do not buy regional food. They get informed about regional foods, from leaflets (34.1%) or social sources (from friends, relatives, acquaintances, personal experience) (Figure 4). They are not willing to travel for regional food (86.4%), resulting from their economic activity (45.4% of economically inactive consumers) and their monthly income. According to Berg, Preston [51], the geographical proximity of local foods and the benefits of their consumption are decisive.

The results of radar graphs (Figure 5) present the dependence of respondents in individual districts on questions about buying domestic food, buying regional foods, their knowledge of regional labeling, their interest in the composition of regional foods and the price of regional foods. All questions are dominated by a positive response (Figure 5a), which is cheering. The assumption of purchasing a regional product is based on the fact that the respondent identifies the brand, identifies the composition and takes into account the price in all four districts (Rimavská Sobota, Rožňava, Revúca and Poltár). As seen, negative responses were show in the food composition assessment. Stated fact indicates that there are still consumers who prefer the price at the expense of the composition (quality) of the food. This fact is justified on the basis of the low monthly income (average 350-550 EUR) in mentioned districts.



(a) (b)

Figure 5. Radar charts compare the aggregate values of the ranges of regional tag data. Legend: a) data summary according answers "yes, no, do not know"; b) summary of responses by district.

The evaluation of the obtained results, with regard to the districts of the respondents, shows that in the Rimavska Sobota and Rožňava regions, the vast majority of consumers buy regional foods. On the contrary, the Poltár Region has the lowest knowledge and the purchase of regional brands. This result reflects the concentration of economically active consumers with higher monthly incomes in the industrially developed regions of the region (Rimavská Sobota). Local inhabitants of behind-the-border regions (Poltár) should pay attention to domestic products to support local capital formation and local development.

In our research of consumer behavior, we also monitored regional food expenditure. Generally speaking, the more developed a country is, the smaller the percentage of household income it spends on food, as this map shows (Figure 6). There are only eight countries in the world that spend less than 10% of their household income on food. Four of these are in Europe: the UK is third at 8.2%, followed by Switzerland at 8.7%; Ireland spends 9.6% and Austria 9.9%. The remaining four countries are spread across the globe. The US spends the least at 6.4%, Singapore spends the second lowest amount at 6.7%. Canada spends 9.1% on food, while Australia spends 9.8% [52].

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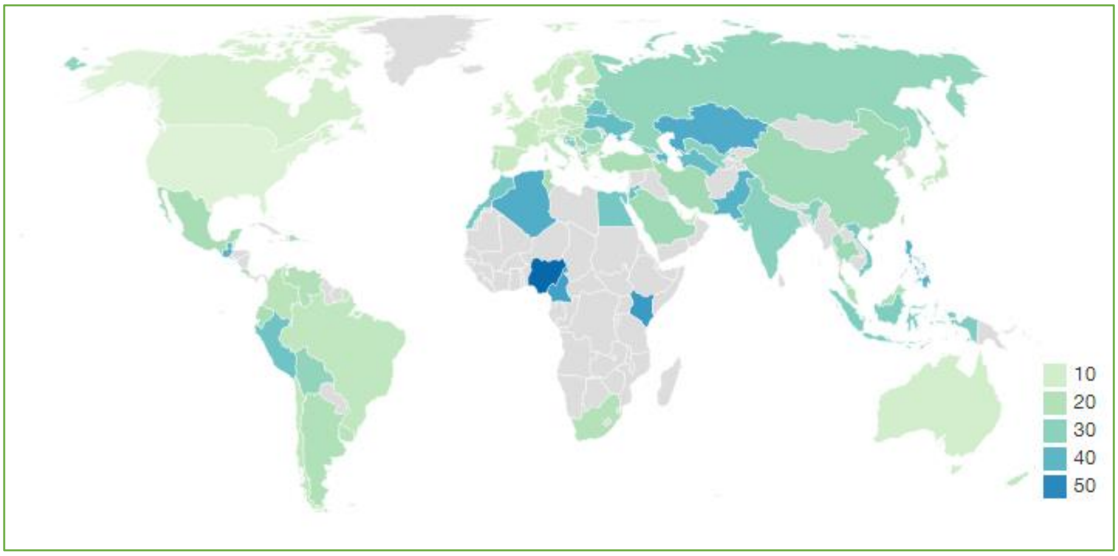

Figure 6. Percentage of consumer expenditure spent on food that was consumed at home by selected countries, Source: World economic forum [52]

According to OECD data in 2017, the Slovak Republic spent € 7073.359 million on food, which is an increase of 15% compared to 2008. Food expenditure in the Gemer-Malohont region accounts for 21.6% of all household expenditure in the Slovak Republic. In connection with the Gemer-Malohont regional brand, we focused on spending on regional food. The average value was about 139 EUR (Table 3).

Table 3. Descriptive Statistics for food consumption expenditure

Food consumption expenditure	Statistic
Mean	138.87
95% Confidence Interval for Lower Bound	132.07
Mean Upper Bound	145.67
Median	130.00
Variance	1788.716
Minimum	70.00
Maximum	250.00
Range	180

We have displayed regional food expenditure by region (Figure 7) by the form of box-plots. In our case, we can state that the regional food expenditure is evenly distributed in Rimavská Sobota and Rožňava. The Rožňava region represents the region where consumer spending is spread over the widest range of values (from EUR 75 to EUR 250). The Rimavská Sobota Region is the only region with extremely remote consumers whose regional food expenditure is higher. In Poltár region, there is a significant concentration of consumers with lower food expenditure than the average. The Revúca region also shows an uneven distribution of regional food expenditure, which is concentrated at the bottom of the values.

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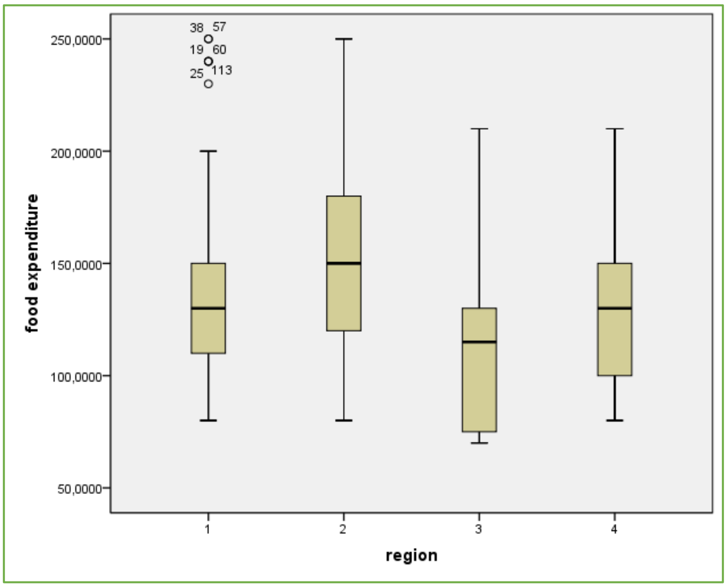

Figure 7. Box-plots of regional food expenditure by region, expressed in EUR. Legend: region is in 1 – Rimavská Sobota, 2 – Rožňava, 3 – Poltár, 4 - Revúca

Box-plot dependence between regional food expenditure and monthly income of respondents (Figure 8) has a linear dependence. It can be stated that the food expenditure increases with the increase of monthly income. Regional products have a higher price thanks to the quality. It is possible to assume that the quantity of food does not change, but respondents are buying quality regional foods.

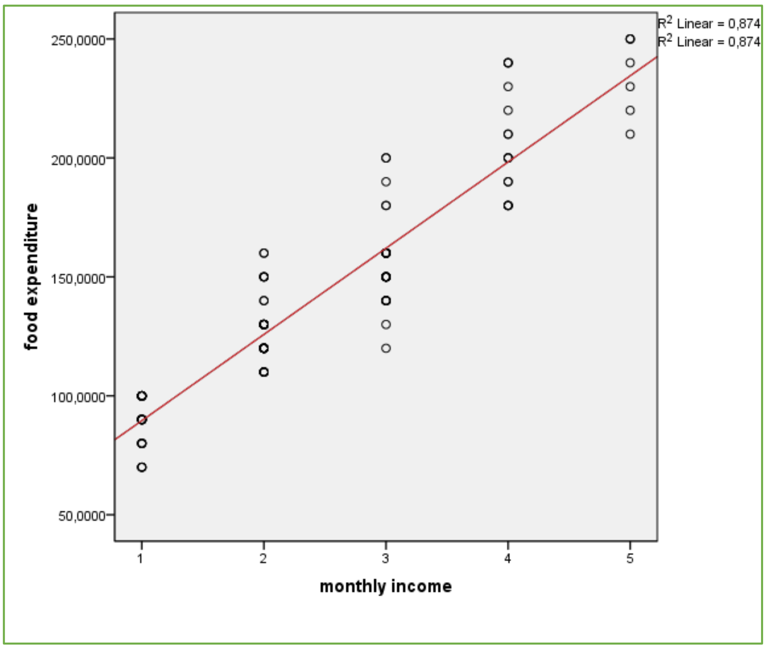

Figure 8. Dependency between regional food expenditure and monthly income of respondents. Legend: monthly income is in 1 – do 350 EUR, 2 – 351-550 EUR, 3 – 551-750 EUR, 4 – 751-950 EUR, 5 – nad 950 EUR.

4. Conclusions

Environmental labelling is a worldwide applicable concept which has become part of strategies, as well as policy of environmental protection, permanently sustainable development and social responsibility. Product labelling does not only serve to set standard of product quality, it has a direct

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influence on consumers, but also on their buying behavior, especially in informing about reaching a certain level in product quality.

The results show the consumer behavior of a selected sample of consumers from the territory of Slovakia and their preference for regional foods. On the basis of the analyses carried out, we can state that the Gemer-Malohont region shows clustering of consumers depending on the development of the territory. We have shown that the more developed regions (Rimavská Sobota, Rožňava) show a higher rate of purchase of regional foods. The rest of the regions (Poltár, Revúca) are represented by lower-income consumers for whom the food price is the decisive criterion. The surveyed region of Gemer-Malohont falls into an area with a larger share of small farmers on the market and a more favorable climate, which is a prerequisite for the development of regional brands.

The authors of the study are aware of some limitations. Firstly, the analysis was carried out only on the example of one regional brand in one European country, and should therefore be replicated on the example of other brands to provide more evidence. It is sensible to monitor and compare countries that differ in the cultural environment. Second, we only looked at basic consumer characteristics. The innovation of the paper is the presentation of one of the most distant regions of the Slovak Republic and the demonstration of the potential of its regional development. In further research, it is possible to examine the psychological aspects of consumers and their impact on the purchase of regional foods.

Acknowledgments: We received funds KEGA 030UMB-4/2017 "Educational Centre for Integrated Safety" for covering the costs to publish in open access.

Author Contributions: Jana Jaďuďová conceived and designed the questionnaire; performed the experiments; analyzed the data; Iveta Marková studies about ecolabeling problems with contents sustainability and wrote the paper; Emília Hroncová contributed analysis of statistical tools.

Conflicts of Interest: "The founding sponsors had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, and in the decision to publish the results".

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