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A Review of Purchasing Preferences for Margarine among Hungarian and International Students

This paper assesses consumer preferences for margarine among Hungarian and foreign university students (studying in Hungary) by using the discrete choice experiment. The questionnaire-based survey was preceded by a focus group interview which, supplemented with knowledge gained from literature, established product attributes involved in the examination (such as price, fat, salt and sunflower oil content). Results suggest that the increase in fat and salt content result in reduced consumer utility and willingness to pay for margarine products. Sunflower oil content, however, was not found to play a significant role in consumer choices. When comparing the two groups, we found that international students tended to be more health conscious than their Hungarian counterparts.

Keywords: consumer preferences, margarine consumption, discrete choice experiment

JEL classifications: I12, M31

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Introduction

The examination of consumer preferences has proved to be one of the most popular topics in economics literature recently. There are a number of studies on what priorities characterise groups of different individuals in relation to certain products/services. The majority of them attempt to draw a distinction between consumer layers based on particular factors, these being primarily cultural, social, personal and other characteristics (Bhatt and Bhatt, 2015).

We are witnessing an ever-increasing emphasis being placed on health awareness in developed societies, primarily induced by the spread of civilisation diseases (cardiovascular diseases, obesity etc.). A major field in this research deals with nutrition, focusing on defining the quantity and composition of nutrient intake necessary for groups of individuals with different characteristics. This area especially considers what kind of macro and micro elements are essential to be consumed for health preservation and also what components of food intake should be reduced or avoided completely (Hamilton *et al.*, 2000; Ares and Gámbaro, 2007; Barreiro-Hurlé *et al.*, 2010; Bowen *et al.*, 2018; Loebnitz and Grunert, 2018).

Based on food research to date, the health effects of margarine can be considered quite a divisive issue. Compared to butter, its primary substitute, it contains considerably larger amounts of unsaturated fatty acids and less saturated fatty acids. However, several studies have found that this beneficial effect was not in direct proportion to the reduced risk of developing cardiovascular diseases (Ramsden *et al.*, 2016; Ajmal *et al.*, 2018; Trautwein *et al.*, 2018; Górska-Warsewicz *et al.*, 2019; Kouli *et al.*, 2019). Salt content must also be mentioned as a further significant product attribute which is also known to contribute to the development of cardiovascular diseases (Mozaffarian *et al.*, 2014; Farquhar *et al.*, 2015; Shin *et al.*, 2018; Frieden and Jaffe, 2018; Jayedi *et al.*, 2019).

There are two main trends in preference assessment procedures in the literature. Revealed methods draw conclusions from the daily choices of consumers, while in the course of

stated methods, hypothetical situations are analysed, making it possible to analyse decision situations involving alternatives currently not available on the market. By using the additional information gained from the latter method, companies are able to make more effective decisions as to whether certain products/services are to be launched onto the market or not, and in addition, their innovation strategies can be more successful (Georgescu, 2007; Aizaki *et al.*, 2014; Birkner *et al.*, 2017; Hanley and Czajkowski, 2019; Mendelsohn, 2019).

The discrete choice experiment belongs to the category of stated preference assessment procedures. The procedure is based on random utility theory, according to which individuals have preference for the alternative with the highest utility level for them as compared to other options. Another feature is the discrete choice situation, which means that only one option will be selected from among the elements of the decision set presented. Finally, we should mention the characteristics of the demand theory developed by Lancaster (1966), assuming that the utility of products/services derive from the level of certain characteristics they contain. In most cases the completion of the experiment is preceded by focus group interviews in order to allow researchers to identify the attributes consumers deem to be the most important regarding the product/service in question, while the choices are made during the questionnaire-based survey. In the evaluation of results, focus is shifted to the choice between different models, all of which have their own advantages and disadvantages (Kjaer, 2005; Louviere *et al.*, 2010; Vossler *et al.*, 2012; Hensher *et al.*, 2015; Hess-Palma, 2019a).

In light of the factors mentioned above, the examination of consumer preferences concerning margarine, with the application of the discrete choice experiment, is likely to result in providing several novel pieces of information. The present study seeks to find out whether there is a difference in health awareness and stated preferences concerning the product in question between the Hungarian and the foreign students studying in Hungary.

Methodology

The research was conducted at the Faculty of Economics and Business of the University of Debrecen with a sample of Hungarian and international students. In compliance with the methodology of the discrete choice experiment, this was preceded by a qualitative procedure (focus group interviews with two groups of Hungarian and two groups of international students with eight participants by each group in September 2019). We chose students in higher education as a target group since they had been found to have extremely disparate divergent behaviour in terms of health awareness in several studies (Yahia *et al.*, 2008; Al-Rethaiaa *et al.*, 2010; Abraham *et al.*, 2018; Kyrkou *et al.*, 2018; Sogari *et al.*, 2018; Alkazemi, 2019; Powell *et al.*, 2019). By supplementing the results of the focus group interviews with knowledge gained from the literature, we defined the product attributes to be examined in the research. It is worth mentioning that it was obvious in the very beginning (even in the qualitative phase) that the two groups differed considerably in terms of their habits as consumers. The selected product attributes included the price (for 450-500 gram packs, in HUF and in € in the questionnaires for international students); fat and salt content (in percentage); and sunflower oil content (Table 1). In order to determine their realistic level, we examined the product supply of several supermarkets. Since we had expected linear effects, “design” coding was used while carrying out the analyses. The questionnaire-based survey was conducted in October and November 2019.

The compilation of alternatives and decision situations was carried out by using Ngene 1.2 software. The D-efficient experimental design, a fractional factorial layout was chosen, which reduces the number of decision situations in a way that the results obtained should remain statistically the most effective. Eight decision situations were generated by the program, all of which contained three product alternatives (Table 2).

Data from the discrete choice experiment were processed with the application of the Apollo 0.0.6 plug-in of the R software (Hess–Palma, 2019b). The selected model specification was a multinomial logit model (MNL) created by McFadden (1973).

The model is based on the random utility theory which means that the person choose the alternative with the highest value of utility from the elements of a decision set. In this

Table 1: Attributes, their levels and coding in the discrete choice experiment.

Attribute	Attribute level	Encoding
Price	1.1 €	Continuous variable
	1.4 €	
	1.7 €	
Fat content	<31%	1
	31-50%	2
	50%<	3
Salt content	<0.51%	1
	0.51-0.8%	2
	0.8%<	3
Sunflower oil content	Contain	1
	Does not contain	0

Source: own composition

case, we can separate the utility to a systematic (observable) and a random (non-observable) part (Equation 1).

$$U_{n,i} = \sum_{k=1}^K \beta_k X_{n,i,k} + \varepsilon_{n,i}, \quad (1)$$

where n is the person, i is the alternative, k is the attribute and ε the non-observable part of the utility. The probability of choice (person n choose alternative i), according to the multinomial logit model came from Equation 2.

$$Prob_{n,i} = \frac{\exp^{\sum_{k=1}^K \beta_k X_{n,i,k}}}{\sum_{i=1}^I \exp^{\sum_{k=1}^K \beta_k X_{n,i,k}}}, \quad (2)$$

According to the model, the utility of individuals is expressed in Equation 3.

$$V_{n,i} = ASC + \beta_1 X_{Price} + \beta_2 X_{Middle.f.} + \beta_3 X_{High.f.} + \beta_4 X_{Middle.s.} + \beta_5 X_{High.s.} + \beta_6 X_{Sunflower\ oil\ cont.}, \quad (3)$$

where $V_{n,i}$ represents the systematic part of the utility of the n -th person in terms of the i -th alternative, while ASC stands for the alternative specific constant value, $f.$ refers to fat content, $s.$ to salt content and $cont.$ to *sunflower oil* content.

Results

The questionnaire had three parts. The first part consisted of questions related to purchasing, consumption and health awareness. The second part contained the decision situations of the discrete choice experiment itself. In the final part, socio-demographic information was surveyed. Descriptive statistics of the sample are demonstrated in Table 3.

Table 3 clearly shows that the Hungarian sample was dominated by females, while the international one by male respondents. As to permanent residence, more than half of the Hungarian respondents live in towns and in small or medium sized towns, while in the case of the international sample, big cities dominate. Differences in the highest level of education are also observable, which is due to the fact that the international sample included more respondents already with a college degree. In terms of income, a considerable proportion of respondents in the Hungarian sample have a monthly net income above 1100 € per capita, while in the international sample, the rate of respondents with income less than 500 € was found to be relatively high.

Table 2: An example of a decision situation.

	Alternative 1	Alternative 2	Alternative 3
Price (€)	1.4 €	1.1 €	1.7 €
Fat content (%)	50%<	<31%	<31%
Salt content (%)	<0.51%	0.51-0.8%	0.51-0.8%
Sunflower oil content	Contain	Contain	Does not contain
Is Your choice (X):			

Source: own composition

Results of the first part of the questionnaire (questions regarding purchase and consumption) are shown in Table 4

Table 4 shows that compared to Hungarian students, considerably fewer international students purchase and consume margarine. This difference has already become obvious during the focus group interviews. Furthermore, results indicate that considering price paid, in the international sample, more students purchase margarine for less than 1 € than in the Hungarian sample. Looking at the place of purchase, we can conclude that Hungarians mostly prefer discount stores, whereas international students favour super- and hypermarkets. Finally, it should be mentioned that the majority of Hungarian students rarely deviate from the brand they usually buy, while a high proportion of international students do not seem to care about brands.

Table 3: Demographic data of the respondents.

Variable	Hungarian sample (N=150)	International sample (N=134)
Gender (%)		
Male	34.7	52.3
Female	65.3	44.0
Did not respond		3.7
Age (mean)	20.6	22.2
Residence (%)		
Township	19.0	2.2
Small town	25.2	6.7
Medium city	11.6	28.4
Big city	44.2	61.9
Did not respond		0.8
Highest level of education (%)		
Graduation	86.4	23.9
Graduation and further qualification	13.6	74.6
Did not respond		1.5
Monthly net income (per capita) (%) (€)		
<500	21.2	32.1
500-800	35.7	34.3
800-1100	21.9	16.4
1100<	21.2	14.2
Did not respond		3.0
Marital status (%)		
Single	80.1	87.3
Life partner / Married	19.9	12.7

Source: own composition

Respondents also had to identify the most preferred brands in both samples. 63% of Hungarian respondents gave an answer to this open-ended question. Their preferences were as follows: Rama 52%, Delma 22%, Flora 12%, Vénusz and Bords eve (both 7%). In the international sample, only 13% of respondents named brands, presumably because of lower levels of brand loyalty. 83% of those naming a brand chose Rama margarine.

Table 4: Respondents' purchase and consumption habits.

Question	Hungarian sample	International sample
Frequency of purchase (%)		
Less frequently than monthly	27	22
1-2 times a month	37	22
1-2 times a week	6	7
3-4 times a week	2	3
Daily	0	2
Do not consume margarine	17	34
Do not know	11	10
Frequency of consumption (%)		
Less frequently than monthly	7	18
1-2 times a month	23	11
1-2 times a week	17	17
3-4 times a week	22	9
Daily	7	3
Several times a day	1	1
Do not consume margarine	19	37
Do not know	4	4
Price paid (%) (€)		
Under 1 €	3	8
Between 1 and 1.3 €	24	19
Between 1.3 and 1.6 €	26	17
Between 1.6 and 1.9 €	11	7
Above 1.9 €	2	4
Do not consume margarine	19	30
Do not know	15	15
Place of purchase (%)		
Variety store	6	2
Retail partnership	10	3
Discount store	31	15
Supermarket	19	20
Hypermarket	15	20
Do not consume	19	40
Brand loyalty (%)		
Do not care about brand	20	27
I often deviate from the brand I usually buy	11	12
I rarely deviate from the brand I usually buy	37	16
Always choose the same brand	13	7
Do not consume	19	38

Source: own composition

Table 5: Results of the Mann-Whitney test according the sample type.

Question	Median / Mean rank		Z-value	Effect-size		
	Hungarian sample	International sample				
Health awareness	4	134.82	4	151.10	-1.718	0.1020
Calorie	3	129.64	3	156.89	-2.843**	0.1687
Distribution of nutrient content	2.5	121.45	4	166.06	-4.655**	0.2762
Glycemic index	2	122.67	3	164.70	-4.404**	0.2613
Vitamin and mineral content	4	124.58	5	162.56	-3.994**	0.2370
Sodium content	2	123.25	3	164.05	-4.301**	0.2552
Fat content	3	131.06	4	155.30	-2.533**	0.1503
Knowledge about differences between saturated and unsaturated fatty acids	3	141.62	3	143.48	-0.193	0.0115
Vegetable oils	3	123.86	4	163.37	-4.125**	0.2448
Effects of Omega 6 fatty acids	4	138.56	4	146.91	-0.872	0.0518
Think the margarines healthy	3	147.41	3	137.00	-1.092	0.0650

Note: **Significant at 5% level.

Source: own composition

As a next step, respondents were asked to assess the importance of 11 statements relating to health awareness on a six-point scale. Our aim was to find out whether there were apparent discrepancies between the two groups (Hungarian and international students), and if so, which answers to the statements were different. For the assessment, the Mann-Whitney test was applied, results of which are shown in Table 5.

Results clearly indicate that there are significant differences in 7 factors (checking the calorie content and the distribution of nutrient content in foods, avoiding products with high glycemic index, sodium content and fat content; the importance of consuming vitamins, minerals and vegetable oils) between the two groups. With regard to all these factors, it is the international students that had a higher mean score suggesting that their behaviour can be considered more health conscious than that of the Hungarian students in the sample.

Next, our aim was to find out whether there were apparent discrepancies between gender, residence, highest level of education, income and marital status levels.

Based on the results of Table 6, it can be concluded that there is significant difference in one factor (fat content) between the gender types. We can see that female students had a higher mean score in Hungarian sample and male students had a higher mean score in international sample.

On the basis of the results of Table 7, we can see that there are significant differences in two factors (health awareness, vitamin and mineral content) between the residence types in the Hungarian sample. The students who live in medium or big cities had a higher mean score according to the two factors.

Table 8 shows no significant differences between the highest level education types according the factors.

It is also observable that there is significant difference in one factor (effects of Omega 6 fatty acids) between the income level types in the Hungarian sample (Table 9). We observed that higher income level students had a higher mean score in this factor.

Table 10 suggests that there are significant differences in three factors (Vitamin and mineral content, Effects of Omega 6 fatty acids, Think that margarines are healthy) which reflect marital status type. According to our results, the students with a life partner or who were married had a higher mean score according vitamin and mineral content in the Hungarian sample and students with life partner or who were married had a higher mean score in relation to the effects of Omega 6 fatty acids and thinking that margarines are healthy in the international sample.

Table 6: Results of the Mann-Whitney test according to gender.

Question	Mean rank				Z-value		Effect-size	
	Male		Female		H	I	H	I
	H	I	H	I				
Health awareness	68.43	70.44	76.96	58.54	-1.197	-1.849	0.099	0.163
Calorie	68.90	70.08	76.71	58.97	-1.083	-1.713	0.088	0.151
Distribution of nutrient content	71.29	69.54	75.44	59.61	-0.576	-1.533	0.048	0.135
Glycemic index	70.56	65.70	75.83	64.17	-0.736	-0.237	0.061	0.021
Vitamin and mineral content	68.62	66.89	76.86	62.76	-1.148	-0.646	0.095	0.057
Sodium content	69.97	67.47	76.14	62.07	-0.864	-0.847	0.071	0.075
Fat content	61.33	72.38	80.73	56.25	-2.694**	-2.487**	0.222	0.219
Knowledge about differences between saturated and unsaturated fatty acids	68.93	66.42	76.69	63.31	-1.070	-0.478	0.088	0.042
Vegetable oils	66.17	65.44	78.16	64.47	-1.659	-0.150	0.137	0.013
Effects of Omega 6 fatty acids	72.37	67.09	74.86	62.52	-0.346	-0.704	0.029	0.062
Think the margarines healthy	68.41	69.79	76.97	59.32	-1.191	-1.619	0.098	0.143

Note: **Significant at 5% level.
Source: own composition

Table 7: Results of the Mann-Whitney test according to residence.

Question	Mean rank				Z-value		Effect-size	
	Township or Small town		Medium or Big city		H	I	H	I
	H	I	H	I				
Health awareness	65.98	72.29	80.36	66.48	-2.106**	-0.512	0.174	0.044
Calorie	68.12	65.54	78.66	67.14	-1.527	-0.140	0.126	0.012
Distribution of nutrient content	70.69	74.00	76.62	66.31	-0.860	-0.672	0.071	0.058
Glycemic index	69.68	57.08	77.42	67.98	-1.127	-0.956	0.093	0.083
Vitamin and mineral content	66.38	62.42	80.04	67.45	-1.985**	-0.447	0.164	0.039
Sodium content	69.97	58.17	77.2	67.88	-1.056	-0.860	0.087	0.075
Fat content	71.55	68.54	75.95	66.85	-0.638	-0.148	0.053	0.013
Knowledge about differences between saturated and unsaturated fatty acids	70.15	53.29	77.05	68.36	-0.993	-1.311	0.082	0.114
Vegetable oils	69.25	56.08	77.76	68.08	-1.228	-1.052	0.101	0.091
Effects of Omega 6 fatty acids	68.09	64.42	78.68	67.26	-1.534	-0.247	0.127	0.021
Think the margarines healthy	73.72	76.79	74.23	66.03	-0.074	-0.943	0.006	0.082

Note: **Significant at 5% level.
Source: own composition

Table 8: Results of the Mann-Whitney test according to highest level of education.

Question	Mean rank				Z-value		Effect-size	
	Graduation		Graduation and further qualification		H	I	H	I
	H	I	H	I				
Health awareness	75.43	65.14	64.95	66.94	-1.059	-0.237	0.087	0.021
Calorie	71.62	64.45	89.13	67.16	-1.749	-0.355	0.144	0.031
Distribution of nutrient content	72.52	63.66	83.38	67.41	-1.086	-0.492	0.090	0.043
Glycemic index	71.75	61.77	88.30	68.02	-1.665	-0.824	0.137	0.072
Vitamin and mineral content	75.39	64.44	65.20	67.16	-1.022	-0.363	0.084	0.032
Sodium content	71.59	66.83	89.28	66.40	-1.783	-0.058	0.147	0.005
Fat content	73.19	68.11	79.15	65.99	-0.596	-0.279	0.049	0.024
Knowledge about differences between saturated and unsaturated fatty acids	73.46	66.27	77.45	66.58	-0.396	-0.040	0.033	0.003
Vegetable oils	72.11	69.06	86.03	65.68	-1.386	-0.445	0.114	0.039
Effects of Omega 6 fatty acids	72.51	65.25	83.45	66.90	-1.093	-0.216	0.090	0.019
Think the margarines healthy	73.90	68.34	74.65	65.91	-0.075	-0.320	0.006	0.028

Source: own composition

Table 9: Results of the Mann-Whitney test according to monthly net income (per capita).

Question	Mean rank				Z-value		Effect-size	
	< 800 €		800 € <		H	I	H	I
	H	I	H	I				
Health awareness	64.17	69.21	75.38	57.44	-1.696	-1.701	0.145	0.149
Calorie	65.41	63.78	73.75	69.23	-1.245	-0.782	0.106	0.069
Distribution of nutrient content	66.05	66.38	72.90	63.59	-1.025	-0.401	0.088	0.035
Glycemic index	64.39	65.28	75.09	65.99	-1.609	-0.102	0.137	0.009
Vitamin and mineral content	65.61	64.93	73.48	66.74	-1.182	-0.265	0.101	0.023
Sodium content	68.00	65.11	70.32	66.35	-0.350	-0.181	0.031	0.016
Fat content	67.96	63.92	70.37	68.94	-0.361	-0.719	0.031	0.063
Knowledge about differences between saturated and unsaturated fatty acids	64.67	66.76	74.72	62.77	-1.492	-0.570	0.127	0.050
Vegetable oils	66.24	67.26	72.64	61.67	-0.953	-0.804	0.081	0.070
Effects of Omega 6 fatty acids	63.17	67.68	76.7	60.77	-2.021**	-0.988	0.173	0.087
Think the margarines healthy	68.18	64.67	70.08	67.3	-0.286	-0.379	0.024	0.033

Note: **Significant at 5% level.

Source: own composition

Table 10: Results of the Mann-Whitney test according to marital status.

Question	Mean rank				Z-value		Effect-size	
	Single		Life partner / Married		H	I	H	I
	H	I	H	I				
Health awareness	72.42	64.76	80.15	80.07	-0.918	-1.498	0.076	0.130
Calorie	73.35	65.85	76.52	71.57	-0.371	-0.555	0.031	0.048
Distribution of nutrient content	72.75	64.81	78.87	79.70	-0.719	-1.446	0.059	0.126
Glycemic index	72.86	65.03	78.45	77.97	-0.661	-1.261	0.055	0.110
Vitamin and mineral content	70.06	65.93	89.37	70.97	-2.278**	-0.497	0.188	0.043
Sodium content	72.88	66.19	78.38	68.93	-0.653	-0.270	0.054	0.024
Fat content	71.00	64.93	85.72	78.77	-1.732	-1.344	0.143	0.117
Knowledge about differences between saturated and unsaturated fatty acids	75.56	64.74	67.93	80.27	-0.889	-1.503	0.073	0.131
Vegetable oils	74.43	65.34	72.33	75.53	-0.245	-0.993	0.020	0.086
Effects of Omega 6 fatty acids	73.87	64.08	74.50	85.40	-0.074	-2.066**	0.006	0.180
Think the margarines healthy	74.05	64.16	73.80	84.77	-0.030	-2.007**	0.002	0.175

Note: **Significant at 5% level.

Source: own composition

Estimations based on the Multinomial logit model (MNL) for the total sample (involving Hungarian and international students) and for two groups are demonstrated in Table 11–13.

From the estimates of the total sample, it can be concluded that price, fat and salt content represent significant

factors affecting consumer choices. All of these attributes have a negative connotation, meaning that any increase in them simultaneously results in the reduction of consumer utility. It must also be stressed that sunflower oil content is not considered a significant factor in consumers making a decision.

Table 11: Results of Total sample model estimation.

	Estimate	Standard error	t-test
ASC_alternative2	0.1952	0.0514	3.80
ASC_alternative3	-0.2408	0.0574	-4.19
Price	-0.6174	0.0003	-5.56
Medium fat content	-0.2286	0.0930	-2.46
High fat content	-0.6872	0.0654	-10.51
Medium salt content	-0.2149	0.0684	-3.14
High salt content	-0.4086	0.0691	-5.92
Sunflower oil content	-0.0076	0.0515	-0.15
Observations		2272	
R ²		0.0627	
AdjR ²		0.0595	
LL		-2,339.525	
AIC		4,695.05	
BIC		4,740.88	

Note: ASC_alternative1, Low fat content, Low salt content and the Does not contain sunflower oil variables represent the basis levels in estimates.
Source: own composition

Table 12: Results of the Hungarian sample model estimation.

	Estimate	Standard error	t-test
ASC_alternative2	0.1011	0.0714	1.42
ASC_alternative3	-0.2274	0.0778	-2.92
Price	-0.6424	0.0005	-4.20
Medium fat content	-0.1028	0.1276	-0.81
High fat content	-0.7132	0.0912	-7.82
Medium salt content	-0.1447	0.0929	-1.56
High salt content	-0.4195	0.0970	-4.32
Sunflower oil content	-0.0647	0.0703	-0.92
Observations		1 200	
R ²		0.0658	
AdjR ²		0.0597	
LL		-1,231.59	
AIC		2,479.18	
BIC		2,519.90	

Note: ASC_alternative1, Low fat content, Low salt content and the Does not contain sunflower oil variables represent the basis levels in estimates.
Source: own composition

Table 13: Results of International sample model estimation.

	Estimate	Standard error	t-test
ASC_alternative2	0.2977	0.0743	4.01
ASC_alternative3	-0.2571	0.0854	-3.01
Price	-0.6008	0.1623	-3.70
Medium fat content	-0.3843	0.1367	-2.81
High fat content	-0.6646	0.0942	-7.05
Medium salt content	-0.3025	0.1014	-2.98
High salt content	-0.4049	0.0987	-4.10
Sunflower oil content	0.0610	0.0763	0.80
Observations		1,072	
R ²		0.0647	
AdjR ²		0.0579	
LL		-1,101.523	
AIC		2,219.05	
BIC		2,258.86	

Note: ASC_alternative1, Low fat content, Low salt content and the Does not contain sunflower oil variables represent the basis levels in estimates.
Source: own composition

Table 14: Results of WTP estimation.

Attribute	WTP of Total sample (€)	WTP of Hungarian sample (€)	WTP of International sample (€)
Medium fat content	-0.37	-0.16	-0.64
High fat content	-1.11	-1.11	-1.11
Medium salt content	-0.35	-0.23	-0.5
High salt content	-0.66	-0.65	-0.67

Source: own composition

Findings from the Hungarian sample also suggest that an increase in price, fat and salt content reduces consumer utility (the effect of medium fat and salt content cannot be considered significant), while sunflower oil content does not influence it.

Results from the international sample shows similar trends to the ones observed with the total and the Hungarian sample. Regarding fat and salt content, the presence of health awareness is also noticeable since their increase reduces consumer utility at the same time. However, it should be noted that in contrast to the Hungarian sample, all levels of fat and salt content produced significant effects. Finally, it should also be mentioned that sunflower oil content was not found to be significant in this sample, either.

The table below (Table 14) demonstrates the results of WTP (Willingness to pay) estimation for the total sample (involving both Hungarian and international students) and for the two groups.

Based on WTP estimation, we can state that in both the Hungarian and the international samples, the increase in fat and salt content resulted in the decrease in their willingness to pay. Regarding the former attribute, compared to the low-fat (below 31%) margarine, representing a base level, Hungarians would be willing to pay approximately 0.16 € less for medium fat content and 1.11 € less for margarine with high-fat content, while the international students would be willing to pay approximately 0.64 € less for medium fat margarine and 1.11 € less for margarine with high-fat content. Taking the latter attribute into consideration, when it is compared to margarine with low (0.51%) salt content, Hungarians would be willing to pay about 0.23 € less for medium and 0.65 € less for high salt content, whereas the data in the case of international students is as follows: about 0.5 € less for margarine with medium and 0.67 € for high salt content.

Conclusions

Our research focused on the examination of consumer preferences regarding margarine. A survey was carried out among university students (Hungarian and international students studying in Hungary) in order to find out whether they indeed represent a disparate layer as had been previously demonstrated by several authors. Furthermore, we intended to establish what differences could be detected between the preferences of the members of the test groups with respect to the product selected.

Based on our results, we came to similar conclusions to the majority of the literature. Significant differences emerged even in consumer habits among the groups studied, which are primarily manifested by the fact that a relatively large proportion of international students do not consume margarine. In terms of health awareness, several differences were identified as well, which led to the conclusion that international students in the sample behaved in a more health-conscious way than Hungarian students. Based on the estimations of the multinomial logit models, it was revealed that the increase in fat and salt content reduced consumer utility and willingness to pay, and also that sunflower oil content did not represent a significant factor in making a purchase decision.

It should be noted that the applied multinomial logit model has two considerably significant limitations, one of which is the estimation of homogeneous preferences for every single respondent, and the other one is the assumption of the independence of irrelevant alternatives. Moreover, its explanatory power () can also be considered rather low, which is a conclusion that may give direction to future research with the possibilities of applying further, more complex models.

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