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STUDY ON CONSUMER PREFERENCES TOWARDS VEGETABLES

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Abstract: *Vegetables play an important role in human nutrition, as they have a high content of nutrients. In the last five years, there has been a tendency to increase the consumption of vegetables among Romanians, this being attributed to the increase of the living standard, but also to the reorientation of the population towards a healthier diet. The present study aims to determine the profile of vegetable consumers by highlighting their attitude and preferences. The research method used in the research paper was the questionnaire administered to a representative sample of 403 respondents. The study identified aspects related to the frequency of buying vegetables, but also the factors that can influence the decision to buy vegetables, such as their condition (frozen, fresh, processed vegetables) and their origin. The identified aspects were related to several socio-professional indicators (sex, age, place of residence, level of education, income) that can define the consumer profile.*

Keywords: *profile, consumption, preferences*

JEL classification: *D11, E21, Q11, Q13*

INTRODUCTION

In order to procure the necessary nutrients for a healthy and active life, man must consume various foods, including vegetables. In recent years, there has been an increase in the share of vegetables in consumer spending, which indicates that people are more attentive to what they consume, but more informed about the effects of food on health. Other factors that have led to an increase in the consumption of vegetable products are the increase in income and the availability of the variety of vegetables [2].

Consumer behavior is influenced by a number of factors that can be both endogenous / internal (need, motives, personality and attitude) or exogenous / external (culture, reference group, family and socio-economic situation) [1,6].

The consumer's decision to buy vegetables is usually based on the analysis of cognitive and emotional elements that may be influenced by advertising or food promotion campaigns, the most appreciated features being: freshness, appearance and price [3,4].

The behavioral and preferential study of the consumer towards agri-food products, fruits and vegetables alike, has been studied in numerous scientific papers, the main purpose being to identify the factors influencing the decision to buy these products but also to create a consumer profile, all undergoing changes. over time due to the constantly changing socio-economic environment [5].

MATERIALS AND METHOD

The present study aimed to determine the profile of vegetable consumers by highlighting their attitude and preferences. By evaluating the consumers' preferences in connection with the purchase of vegetables, the factors that influence the purchasing decision are also identified.

The research method used in this research paper was the questionnaire, with a number of 403 respondents. In this study were identified aspects related to the frequency of buying vegetables, the places where they were purchased, the amount allocated. These identified aspects were related to a

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series of indicators such as sex, age, income, place of residence, indicators that can build the profile of the vegetable consumer.

In order to determine the link between socio-economic factors and the frequency of consumption of vegetables, the Chi-square test was applied.

The Chi square test (χ^2) indicates whether there is a link between two variables, by checking the hypothesis of an association between them. This test is used to interpret the incidence tables that were generated by cross-applying the pairs of factors studied in the study.

To determine Chi-square we start from the following hypotheses:

- a. H0 - null hypothesis - when the two variables are independent;
- b. Ha - alternative hypothesis - when there is an association between the two variables.

The calculation formula of χ^2 is as follows [7]:

$$\chi^2 = \sum_{i=1}^n \frac{(O_i - E_i)^2}{E_i}$$

Where,

O -represents the observed frequency;

E- represents the theoretical frequency;

n and i - represent the number of rows and columns of the incidence table, respectively.

If at least 80% of the probable frequencies exceed the value 5 and all probable frequencies exceed the value 1, the Chi square test is valid. [8.9]

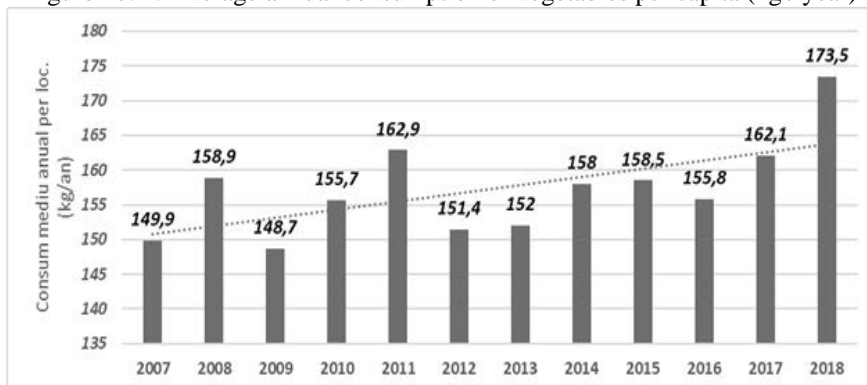
Using the method of ordering the ranks, it was possible to establish a hierarchy of decision-makers that can influence the consumption of vegetables. This method is a comparative scaling method by which the appreciation of a sample can be established according to an evaluated criterion for a given product. In order to be able to process the information, they will be classified by ranks with the help of scores from 1 - the least important to 5 very important (in this case). By processing the data, the average scores of each criterion subject to evaluation will be determined, so they will be ranked according to the value obtained. [9]

RESULTS AND DISCUSSIONS

1. Average annual consumption of vegetables in Romania and the EU

Analyzing the average annual consumption of vegetables per person at national level, it can be seen in figure no.1 that during 2007-2018, it registered a growth trend of 15.74%, from 149.9 kg / person in year 2007, at 173.5 kg / pers. in 2018. The average annual rate recorded is 1.34%, this increase being attributed to the increase in living standards.

Figure no. 1. Average annual consumption of vegetables per capita (kg / year)



Source: INSSE data [10].

Taking into account the average consumption of vegetable varieties, it was observed that:

- the average annual consumption of onions shows an oscillating evolution. In 2018 it registered an increase of 26.11% compared to the consumption registered in 2007 located at the value of 18 kg / capita;
- in the case of tomato consumption, a downward trend is observed, so that if in 2007 it was consumed per year 46.4 kg / inhabitant, in 2018 it was 41.4 kg / capita, a decrease of 10.78 %;
- consumption of edible roots shows an oscillating trend. In 2018 it registered a consumption of 15.5 kg / capita, increasing compared to the consumption registered in 2007 when it was 9.5 kg / capita, which could be attributed to the decrease of the sale price;
- the evolution of cucumber consumption shows an upward trend, so that in 2007 it was 5.9 kg / capita, while in 2018 it registered an increase of 84.75% reaching a consumption of 10.9 kg / capita, the annual registered rate being of 5.74%.

Table no. 1. Average annual consumption per capita (kg / year)

Specification	2007	2018	Annual rithm (%)	2018/2007 (%)
Tomato	46,4	41,4	-1,03	-10,78
Dried onions	18	22,7	2,13	26,11
Cabbage	40,8	44,5	0,79	9,07
Edible roots	11,6	15,5	2,67	33,62
Pepper	9,2	13,4	3,48	45,65
Green pea	1,2	1,5	2,05	25,00
Green beans	2,3	3,3	3,34	43,48
Cucumbers	5,9	10,9	5,74	84,75
Other vegetables	14,5	20,3	3,11	40,00

Source: *INSSE processed data [10]*.

According to Eurostat statistics, in 2017, 28.6% of the population consumed vegetables once a day and more than one portion, 12.6%.

At the level of 2017, a percentage of 63.5% of the U.S. population. consume vegetables daily, 27.3% of the population consume at least twice a day, and 5.4% consume vegetables at least once a week.

According to Eurostat statistics, Romania, Bulgaria, Lithuania, Latvia and Hungary are the only five EU member states in which less than half of the population consumes vegetables daily. Thus, in Romania 41.2% of the population consumes vegetables daily, compared to 30.3% in Hungary, 44.4% in Latvia and 44.8% in Lithuania and Bulgaria.

Figure no. 2. The share of the EU population consuming vegetables daily in 2017
(Percentage of population, -% -)



Source: *Eurostat data processed [12]*.

Among the European Union countries, the largest vegetable lovers are in Ireland, Belgium, Italy and Portugal population shares of 84%, 83.8%, 80.4% and 78% respectively, most countries ranging from 50% to 80% regarding the percentage of people who eat vegetables at least once a day.

2. Analysis of vegetable consumer preferences in Romania

In order to obtain information on consumer preferences for vegetables, a questionnaire survey was conducted in 2020. The sample size was 403 respondents, of which 68.98% were female and 31.02% were male, 34.74% from the rural area and 65.26% from the urban area. It was also observed that about 42.7% are in the age category under 25 years, and over 75.9% have higher education (table no. 2).

Table no.2 The structure of the respondents according to gender, age, environment of residence and level of education

Gender of respondents n = 403		nr.	%	Residence environment n = 403		nr.	%
female		278	68,98	Rural		140	34,74
male		125	31,02	Urban		263	65,26
Total = 403 respondents							
Age of respondents n=403		nr.	%	Education level n = 403		nr.	%
> 25ani		172	42,68	Primary education		4	0,99
25-34		50	12,41	Gymnasium studies		9	2,23
35-44		79	19,60	High-school studies		69	17,12
45-54		91	22,58	Post-secondary education		15	3,72
>54		11	2,73	Higher education		306	75,93
Total = 403 respondents							

Source: own calculations

It is important to note that female consumers consume vegetables more frequently than male consumers, so that 79.5% of women consume a lot and a lot of vegetables and men 67.2% (Table no. 3). One woman said she did not eat vegetables and 4 men.

In order to determine whether there is a link between the consumer's gender and the frequency of consumption, the calculation of test X² cancels the null hypothesis that there is no link between the two variables. Thus, it can be stated with a 99% probability that the gender of the respondents has a significant influence on the frequency of consumption of vegetables.

Table no.3 The connection between the respondents' gender and the frequency of consumption of vegetables

Gender	UM	The frequency of consumption of vegetables					Total	
		not at all	Very little	little bit	a lot	very much	No	%
Female	No	1	8	48	158	63	278	68,98
Male	No	4	6	31	68	16	125	31,02
Total	No	5	14	79	226	79	403	100,00
	%	1,24	3,47	19,60	56,08	19,60	100,00	*
Indicator	X ² calculate		Degrees of freedom		X ² table value		Threshold of significance	
	13,39		4		13,28		0,01	

Source: own calculations

In the case of the analysis of the influence of the residence environment on the frequency of consumption of vegetables (table no. 4), by calculating the X² test, it was observed that there is no significant connection between the two variables. Thus, there are no significant differences between

the answers given by rural and urban respondents, over half of them in both areas of residence (56.4% and 56% respectively) consuming "many" vegetables..

Table no.4. The connection between the respondents' environment of residence and the frequency of consumption of vegetables

Gender	UM	The frequency of consumption of vegetables					Total	
		not at all	Very little	little bit	a lot	very much	No	%
rural	No	3	5	28	79	25	140	34,74
urban	No	2	9	51	147	54	263	65,26
Total	No	5	14	79	226	79	403	100,00
	%	1,24	3,47	19,60	56,08	19,60	100,00	*
Indicators	X ² calculate	Degrees of freedom			X ² table value		Threshold of significance	
	1,77	4			1,65		0,8	

Source: own calculations

Taking into account the influence of income on the frequency of vegetable consumption, it was found that of those who answered the questionnaire, most (a share of 38.7%) are in the income category between 2000-3001 lei (table no. 5). A percentage of 8.44% have an income below 1000 lei per month and a percentage of 9.18% exceed 6000 lei per month. Calculating the influence of income on the frequency of consumption of vegetables, it is found that there are no significant differences between their answers by income category, so that the X2 test does not indicate a link between the two variables..

Table no.5. The link between respondents' income and the frequency of consumption of vegetables

Income	UM	The frequency of consumption of vegetables					Total	
		not at all	Very little	putin	not at all	Very little	nr	not at all
sub 1000 lei	nr	0	1	5	21	7	34	8,44
1001-2000 lei	nr	0	2	10	37	10	59	14,64
2001-3000 lei	nr	3	6	25	90	32	156	38,71
3001-4000 lei	nr	0	2	17	37	13	69	17,12
4001-5000 lei	nr	1	1	10	15	2	29	7,20
5001-6000 lei	nr	1	1	2	10	5	19	4,71
peste 6000 lei	nr	0	1	10	16	10	37	9,18
Total	nr	5	14	79	226	79	403	100
	%	1,24	3,47	19,60	56,08	19,60	100	*
Indicatori	X ² calculate	Degrees of freedom			X ² table value		Threshold of significance	
	20,93	24			21,65		0,6	

Source: own calculations

In table no. 6 centralized the results of the X2 test for the consumption preferences of fresh vegetables, frozen or preserved depending on the income of the respondents. It is observed that, in the case of consumption preferences of canned and frozen vegetables, the calculated values of X2 of 31.56 and 31.65, respectively, exceed the value of tabular X2 (30.84) for a significance threshold of 0.03. Thus, it can be concluded that for the consumption of frozen and canned vegetables, the income of the respondents has a very significant influence, with a probability of 97%.

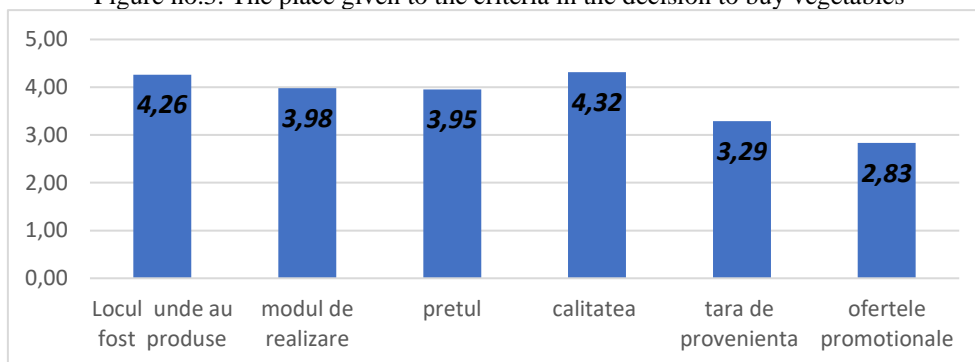
Table no.6. Link between vegetable consumption preferences: fresh, frozen or preserved, depending on respondents' income

Income		X ² calculate	Degrees of freedom	X ² table value	Threshold of significance
	consumption preferences of vegetables: fresh	13,89	18	12,86	0,8
	consumption preferences of vegetables: canned (compote, jam, etc.)	31,56	18	30,84	0,03
	vegetable consumption preferences: frozen / dehydrated	31,65	18	30,84	0,03

Source: own calculations

Using the Method of ordering the ranks for processing the results, a hierarchy of criteria was made according to which the decisions to buy vegetables are made. In the first place, the respondents chose the quality, followed by the place where the vegetables were produced (solar / greenhouse), the production method (conventional / ecological), the price, the country of origin and the promotional offers, according to the following figure:

Figure no.3. The place given to the criteria in the decision to buy vegetables

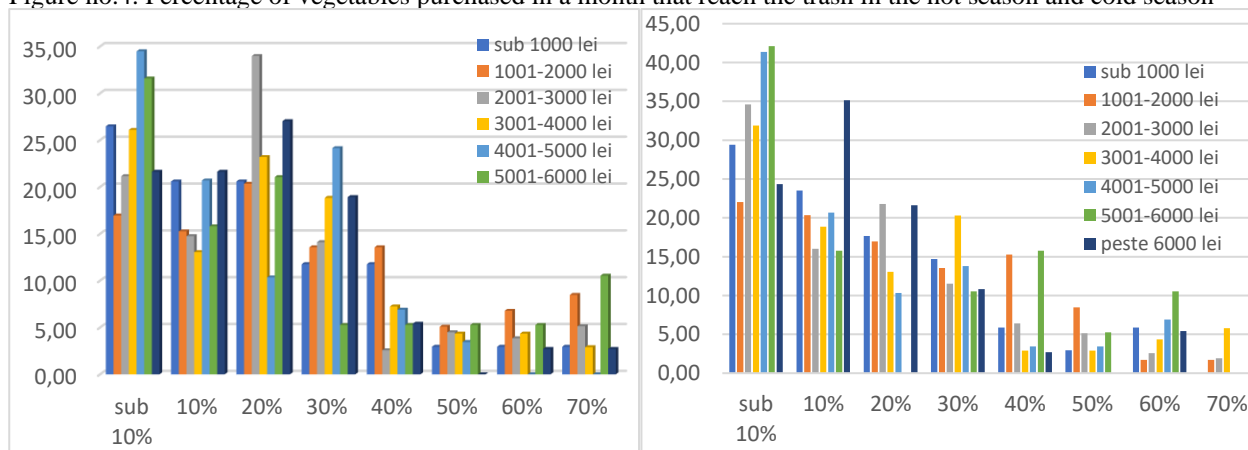


Source: own calculations

The study also highlighted the fact that a significant amount of vegetables is thrown away in both the hot and cold seasons, which involves a large waste of food and a source of pollution. The survey showed that over 26% of respondents throw about 20% of the quantity of vegetables bought in the hot season and in the cold season 31.8% of respondents throw less than 10%.

If we refer to the percentage of vegetables thrown in the trash depending on the income of the respondents, figure no. 4, those from the income categories between 4001-5000 lei and 5001-6000 lei stand out, which in a large share throw more less than 10% in both the hot and cold seasons.

Figure no.4. Percentage of vegetables purchased in a month that reach the trash in the hot season and cold season



Source: own calculations

Respondents with incomes between 2001-3000 lei throw in the hot season 20% of the vegetables bought, and those in the category of over 6000 lei most throw in the cold season 10% of the vegetables bought. What is worrying is the fact that there are consumers who throw away up to 70% of the purchased vegetables from the purchased quantity, so that in the hot season both those with low incomes and those exceeding 6000 lei are in this category, and in most of the cold season are in the income category of 3001-4000 lei; these things indicate poor shopping management, buying more than necessary regardless of income.

CONCLUSIONS

The elaborated study contributes to the determination of the profile of the Romanian vegetable consumer, thus constructing a current overall image of him. The respondents of this study fall into the age category of over 25 years. They appreciate the consumption of vegetables as a very important one in the diet so that, making a distinction according to gender, it was found that female consumers consume more vegetables than male consumers. Analyzing the economic factor, namely income, which can influence vegetable consumption, it was observed that although respondents fall into different income categories, vegetable consumption is not influenced by this factor, ie no more vegetables are consumed if income is higher. large, but can influence the category of vegetables purchased (frozen, fresh or canned).

Recently, it has been observed that Romanian consumers are more attentive to the characteristics of purchased agri-food products. This fact can be seen in the present study, so that a first important factor in the decision to buy vegetables is the quality of vegetables, being followed by the place where the vegetables were produced (solar / greenhouse) and how to make (conventional / ecological system).

Considering the fact that over a percentage of 57% of the purchased foods are vegetables, it was considered necessary to analyze the quantities of vegetables that reach the trash in the cold / hot season, being considered a food waste. Thus, it was concluded that a share of over 26% of the interviewed consumers throw about 20% of the quantity of vegetables bought in the hot season and in the cold season 31.8% of the respondents throw less than 10%.

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