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THE EVOLUTION OF FOOD CONSUMPTION IN ROMANIA IN THE POST-ACCESSION PERIOD TO THE EUROPEAN UNION

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Abstract

Among the fundamental human needs, the provision of food products can be mentioned, as a necessary condition for the survival of each individual. Among the influencing factors of food consumption can be mentioned the income and expenditure of the population allocated to the purchase of food. After the accession to the EU, oscillating evolutions of consumption were recorded, regardless of whether it is about the consumption of different social categories, in total, development regions or environments, but also by nutritional elements. In the context of these aspects, the object of this approach is represented by the analysis of the consumption of food products, respectively highlighting the changes and gaps registered after joining the EU. From a methodological point of view, the current approach is based on public information regarding the evolution of food consumption and the main influencing factors. The analysis of the existing data highlighted the increasing trend in the consumption of certain food products, as well as the incomes and expenses of the population by social category. It is also worth noting the worrying trend of increasing the consumption of carbohydrates and lipids with negative effects on the health of the population.

Key words**:** *consumption, incomes, expenses, social categories, nutritional elements*

INTRODUCTION

Defined as the total expenses incurred for the procurement of goods in a given period of time, consumption represents the use of the goods purchased to satisfy personal and collective needs. Among the purchased goods and services, food and beverages have an important place, given the need to ensure the population's food.

The increase in the consumption of agri-food products largely depends on the increase of population's incomes, as well as on the consumption behaviors specific to each social category.

The approach to the problem of consumption in general has been the subject of several specialized studies over time, but also of the elaboration of specific regulations in this field.

The size and structure of consumption are determined by economic factors, namely the population's incomes and the prices of consumer goods, but also by demographic, social, geographical, conjunctural factors, etc. [9, 11].

On the other hand, we should not overlook the fact that the importance of this indicator, namely the consumption of food products, is justified by the total percentage held in the consumption expenses of each social category [6].

In economic theory, consumption provides the conditions for increased productivity and economic growth, with positive effects on the population's well-being [10].

We can consider that a sustainable food system, which includes consumption, must ensure a sufficient and diversified supply of safe, nutritious, accessible and sustainable food for the population, at all times.

According to experts, while in the EU the average consumption of energy, red meat, sugars, salt and fat continues to exceed recommendations, consumption of whole grains, fruit and vegetables, legumes and nuts is insufficient [12].

Given the environmental impact of food consumption, there is growing concern about the ability to decouple economic growth and the environmental impact of consumption, resource use and waste generation [4].

In the opinion of the European Commission, current patterns of food consumption are not sustainable, neither from the point of view of

health, nor from the point of view of impact on the environment.

Thus, in order to improve the availability and prices of sustainable food products and to promote a healthy and sustainable diet for the population, there is a need to identify ways to establish mandatory minimum criteria for sustainable food purchases [3].

According to some specialists [5], ensuring a sustainable food system contributes, among other things, to increasing the productivity of the agri-food sector and reducing production costs.

In Romania, the studies carried out in the field of food consumption are closely related to its role in the need to ensure food safety and security.

Thus, the interaction between agricultural policies and food security, as well as the effects of agricultural policies on food security are multiple, both direct and indirect, determining both the balance of the markets and the individual consumption of the population [7].

Without reviewing the entire specialized literature, in reference to the object of this approach, it should be mentioned that experts consider that the changes produced in the agri-food sector have had an important impact on the consumption of food products in the post-accession period.

Thus, in the last decade, there was an increasing acute shortage of domestic food supply that could not support the consumption needs of the population, under the pressure of increasing consumption of products with high nutritional value (animal products, vegetables, fruits, fish), against the background of economic growth and of the increase in population incomes implicitly [1, 2].

In the context of the above, the object of this approach is the analysis of the structure of food consumption and the most relevant influencing factors.

MATERIALS AND METHODS

Information from the Tempo-Online (INS) database was used to analyze the changes in the structure of food consumption as well as the influencing factors. This information was analyzed using the methods of dynamics and structures. Also, an econometric model was developed to measure the degree of influence of the factors.

The following primary indicators were taken into account for the analysis, respectively: consumption of food products, expenses incurred for the purchase of agri-food products, as well as the incomes obtained, by total social categories, later detailed by categories of employees, pensioners and farmers.

To ensure the comparability of the value indicators, they were transformed into comparable prices, using the general index of consumer prices, based on 2007. The analysis period is 2007-2022. To facilitate the tabulation of results, the annual values at 5 years from the reference period were retained.

RESULTS AND DISCUSSIONS

The accession to the European Union required sustained efforts to adapt to European requirements and rigors, but at the same time it generated deep changes at all levels of economic and social life.

As an important element of food security, the consumption of food products has had oscillating evolutions from one year to the next, being influenced both by the level of expenses for food procurement, and mainly by the incomes obtained by each social category. The inflation rate is added to these, with a direct impact on the purchasing power of the population, as well as the existing gaps by residence areas, which consequently influenced the consumption of food products.

As regards the total average income per household, the period 2007-2022 is characterized by an increasing trend both for the national economy as a whole and for urban/rural areas. Thus, while the overall average household incomes doubled in 2022 compared to 2007, with percentages that oscillated from +73.8% (pensioners) to 111.7% (employees), in the rural areas, the average incomes registered a total increase of 112.6%, with the category of employees above the total average, by a 2.3 percent increase (Table 1).

Table 1. Evolution of total average monthly incomes per household in rural areas, in the period 2007-2022 (lei, constant prices 2022)

	Total	Employees	Farmers	Pensioners
2007	2,572.1	3,794.9	2,350.1	2,231.5
2011	3,063.2	4,100.4	3,061.3	2,758.5
2016	3,305.0	4,805.0	2,920.5	2,722.8
2021	5,242.6	7,986.1	3,973.6	3,692.8
2022	5,468.3	8,132.2	4,221.2	3,897.6

Source: Own calculation on the basis of Tempo-Online data, NIS, 2023 [8].

Speaking about the total average monthly expenses per household, it should be noted that over the course of 16 years, i.e. after the accession to the European Union, these expenses have increased by 98.3%, with percentages ranging from 58.5% (pensioners) to 106% (employees).

In the rural areas, the increase in total average monthly expenses per household is more pronounced compared to total, doubling in 2022 compared to 2007. While in the case of pensioners' households, the average total monthly expenses per household increased by 56.7% in 2022 compared to 2007, in employees' households the increase exceeded the total average by 13.5 percentage points (Table 2).

Table 2. Evolution of total average monthly expenses per household in rural areas, in the period 2007-2022 (lei, constant prices 2022)

	Total	Employees	Farmers	Pensioners
2007	2,388.2	3,367.9	2,256.0	2,094.2
2011	2,872.5	3,808.3	2,932.1	2,545.5
2016	2,903.9	4,190.6	2,652.0	2,357.1
2021	4,521.3	6,841.4	3,619.7	3,153.1
2022	4,807.0	7,235.8	3,896.4	3,282.5

Source: Own calculation on the basis of Tempo-Online data, NIS, 2023 [8].

In the same reference period, the total average expenditure per household for food and beverages consumed increased by 64.2% in total, with percentages ranging from 52.2% (employees) to 84.8% (farmers). Unlike the total average, in rural areas, this category of expenses increased by no less than 90.7% in 2022 compared to 2007, the largest increase being found in farmers' households (+84.8%). However, in constant prices, the highest expenses for food and drinks purchased in rural areas were noticed in the category of employees, i.e. 1,098.4 RON/month in 2022 compared to 645.6 RON/month (2007) (Table 3).

Table 3. Evolution of average monthly expenses for food and beverages per household, in rural areas, in the period 2007-2022 (lei, constant prices 2022)

	Total	Employees	Farmers	Pensioners
2007	447.7	645.6	382.7	378.2
2011	525.5	701.7	460.7	468.5
2016	561.7	743.2	493.1	469.8
2021	792.7	1,022.0	646.7	645.2
2022	853.9	1,098.4	707.4	678.4

Source: Own calculation on the basis of Tempo-Online data, NIS, 2023 [8].

Expenditures for the purchase of food products registered a total increase by 60% at national level, by percentages ranging from 47.5% (employees) to 84.1% (farmers). In rural areas, increases in this category of expenses ranged from 66.3% (employees) to 84.7% (farmers), while the rural average increased by 87.8% (Table 4).

Table 4. Evolution of average monthly expenses for the purchase of food per household, in rural areas, in the period 2007-2022 (lei, constant prices 2022)

	Total	Employees	Farmers	Pensioners
2007	440.2	631.2	375.5	373.7
2011	516.5	686.5	452.8	463.1
2016	546.5	714.2	478.4	461.3
2021	771.2	984.0	635.0	633.4
2022	826.8	1,049.7	693.6	665.5

Source: Own calculation on the basis of Tempo-Online data, NIS, 2023 [8].

Regarding the average monthly consumption, from the data provided by the INS, information was selected for a number of 9 products, from the analysis of which the following aspects can be deduced:

-The average monthly consumption of bread and bakery products decreased by 2%, from 9.9 kg/inhabitant (2007) to 7.9 kg/inhabitant (2022) respectively, by percentages that oscillated from -1.9% (farmers) to -2.3% (employees);

-The average monthly consumption of meat and meat preparations, as well as that of cheese and cream, and also eggs, had an upward trend, while oil consumption remained relatively constant, except for pensioners' households (+0,1%); among the previously mentioned products, the most significant increases in consumption were found in eggs, with percentages that oscillated from 1.1%

(employees and farmers) to 2.6% (pensioners). Practically, from a total average monthly consumption of 13.3 eggs in rural areas in 2007, after 16 years, the consumption reached 14.6 eggs in 2022;

-In potatoes, although this product is known to be a basic food product, in the year 2022 compared to 2007, in the rural areas, the average monthly consumption decreased by 0.7% both in total, as well as in the categories of employees and pensioners (Table 5).

Table 5. Dynamics of the average monthly consumption of food products in the rural area, in the period 2007-2022 (%)

	Total	**Employees**	**Farmers**	**Pensioners**
Bread and bakery products (kg)	-2.0	-2.3	-1.9	-2.0
Fresh meat (kg)	1.2	0.8	0.4	1.4
Meat products (kg)	0.5	0.4	0.4	0.6
Milk (liters)	-1.4	-1.3	-1.7	-1.2
Cheese and cream (kg)	0.3	0.3	0.1	0.3
Eggs (number)	1.6	1.1	1.1	2.6
Oil (kg)	0.0	0.0	0.0	0.1
Potatoes (kg)	-0.7	-0.7	-0.6	-0.7
Sugar (kg)	-0.1	-0.1	0.0	-0.1

Source: Own calculation on the basis of Tempo-Online data, NIS, 2023 [8].

As regards consumption by nutritional factors, it should be noted that in 2022 compared to 2008, the average daily food intake in calories increased by 0.3%, by percentages oscillating from -1.1% (employees) to 3.9% (pensioners). Specifically, with reference to pensioners, for instance, the average daily food intake in calories increased from 2,616.8 calories (2008) to 2,718.5 calories (2022). Practically, in the year 2022, the average daily food intake in calories in the case of pensioners exceeded the national average by 227.4 calories, being the highest consumption among the analyzed social categories.

The same upward trend was noticed in the average daily consumption of protein which reached 86.4 grams in 2022, up by 4.3% compared to 2008. The highest increase was also noticed in the category of pensioners (+8.2%), from 87 grams (2008) to 94.1 grams (2022) respectively.

However, quite a worrying increase is noticeable in the average daily consumption of fats and carbohydrates, with negative effects on population's health. Thus, in fats, the average daily consumption increased from 85 grams (2008) to 98.6 grams (2022) overall, while for carbohydrates, this indicator increased from 316.6 grams (2008) to 357.4 grams (2022). In the case of these two indicators, the category of pensioners also showed the highest increase among the analyzed social categories, namely +20.9% (fats), and +3% (carbohydrates) respectively, which reflects an unbalanced diet of the population.

From the analysis of available information, it results that the level and quality of food consumption essentially depends on the level of incomes and expenditures allocated to the procurement of food products. Also, as I mentioned before, an important factor is the level of inflation, with influence on the prices of food products and the purchasing power of the population.

In order to test this statement, during this approach, an econometric model was built for exemplification, based on the following indicators, for the category of rural pensioners: consumption of fresh meat (cons), average monthly expenses for the procurement of food (expenses), average monthly earned income (income) and inflation rate (ipc).

This model can later be extended for all categories of products, incomes and expenses, for each social category separately. It should be noted that the model was built based on the E-views software.

In the context of the above-mentioned, between the analyzed indicators there is a degree of correlation ranging from 85.3253 (ipc-expenditures) to 98.9046 (consumption-ipc) (Table 6).

Table 6. The degree of correlation of analyzed indicators

	Expenses	**Cons**	**Ipc**	**Income**
Expenses	1.0000	0.8647	0.8533	0.9265
Cons	0.8647	1.0000	0.9890	0.8739
ipc	0.8533	0.9890	1.0000	0.8261
Income	0.9265	0.8740	0.8261	1.0000

Source: author's own calculations using E-views software.

To build an equation, it is considered that the level of consumption is a function of expenses, income and inflation.
In this sense, to explain the verified economic phenomenon, a multifactorial model was used (it has several explanatory variables of back-looking type). The equation of the model is:
cons c expenses income ipc
Following the application of this equation, the influence of the indicators on consumption generated the following values (Table 7).

Table 7. The influence of indicators on consumption
Method: Least Squares
Period: 2007-2022
Number of observations:16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Expenses	-0.008868	0.004286	-2.069.067	0.0608
Income	0.001487	0.000613	2.424.715	0.0320
IPC	2.070.352	0.431832	4.794.344	0.0004
C	0.564822	0.249333	2.265.335	0.0428
R-squared	0.913530	Mean dependent var		3.331.250
Adjusted R-squared	0.891913	S.D. dependent var		0.430068
S.E. of regression	0.141392	Akaike info criterion		-0.862249
Sum squared resid	0.239899	Schwarz criterion		-0.669102
Log likelihood	1.089.799	F-statistic		4.225.905
Durbin-Watson stat	1.522.463	Prob(F-statistic)		0.000001

Source: author's own calculations using E-views software.

Analyzing the estimated parameters, it can be noticed that they are statistically significant at a significance threshold of 5%. Since in the Prob column the values recorded for the probabilities associated with the t-statistic tests are less than 0.05, we can state with a 95% probability that the estimated parameters are statistically significant.
Analyzing the data from Table 7, it can be noticed that:

-**R^2 = 0.913530** represents the coefficient of determination of the model.
This high value of R^2 indicates that the proposed model explains well the economic phenomenon in reality.
-**F-statistic = 42.025906**, tests the hypothesis that all coefficients of the proposed model are simultaneously 0.
-**Prob (F-statistic) = 0.000001**, represents the probability associated with the F-statistic test, which must be as small as possible to reject the null hypothesis, according to which all model coefficients are zero.
For model testing and stability, two methods were used, namely the existence of autocorrelations at residual level and the CUSUM test.
Regarding the existence of some autocorrelations at residual level, the correlogram of residuals was made, with 24 lags. Analyzing this correlogram it is noticed that there are no autocorrelations (all probabilities associated with the statistical Q test - Ljung-Box Test > 0.1) (Fig. 1).

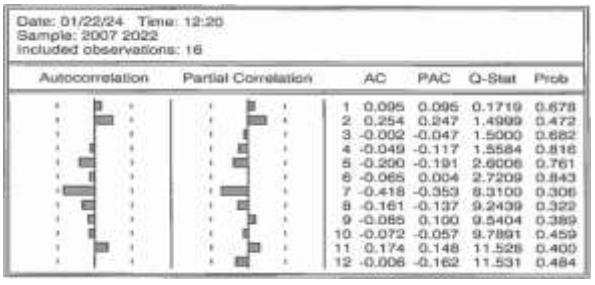

Fig. 1. Correlogram of residuals
Source: author's own calculations using E-views software.

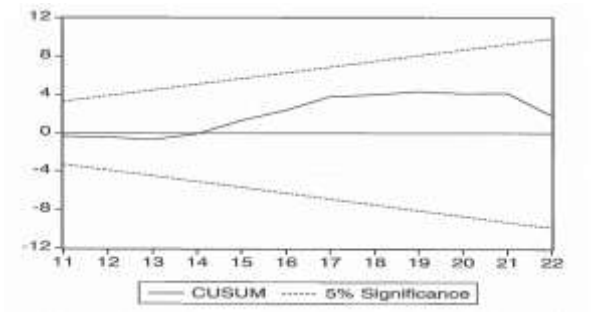

Fig. 2. CUSUM test
Source: author's own calculations using E-views software.

Regarding the stability of the model, from the analysis of the Cusum test it can be noticed that there are some shocks of the explanatory

variables, but these do not create instability at the level of the explained variable (Fig.2).

CONCLUSIONS

From the analysis of available information, it results that both incomes and expenses for the procurement of food registered important increases in the post-accession period. However, the growth rate of incomes is clearly lower than that of expenses for food procurement, the latter being influenced by the increase in product prices, as well as by the inflation rate.

From the nine categories of products analyzed, a decrease in consumption is found in five categories, the highest decreases being noticed in bread and bakery products, for all social categories.

Increases in consumption were recorded for four products with percentages varying, in total, between 0.3% (cheeses) and 1.2% (fresh meat).

A worrying phenomenon is represented by the increase in the consumption of fats and carbohydrates, with negative effects on population's health.

In the context of the above, we consider it necessary for decision-makers to implement measures to ensure sustainable consumption, with beneficial effects at all levels of economic life, also including population's health.

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