# EXPEDITURE OUTFLOW AND FOOD CONSUMPTIONS IN ROMANIA

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**Abstract.** *The present work aims at investigating the trends of the expenses – expenditure outflow - so that the pattern and the amount of the food consummation should be figured out. The trends of the expenditure outflow is reflected by specific indexes: the operating costs included in the present study are total operating expenses, money expenses, food expenses and the internal expenses of the farmhouse. The influences of the operating costs of the producers induce a specific trend on the consumers of the main food products: grains and cereals, milk and dairy products, fish and meat and related products. Based on these indexes it is possible to run out and complete a certain degree of the food security in Romania. One starts from quantitative records: dynamic evolution of the quantum of consumed food products and related expenses. Also qualitative details are pointed out: the level and the cumulative flow rate that correlates the indexes expenses – consumed products.*

**Key words:** food consummation, expenditure outflow, food security, consumed food products, consumed expenses

## 1.INTRODUCTION

There are permanent changes in food guidelines from quantity to quality, for which reason a special role is played by factors influencing food consumption. They are very many in number, result not only from the field of agriculture, but have a much larger area. The variables themselves, such as the socio-demographic ones, represent the structure of a multitude of elements, including costs incurred

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as a sizing result that raises the question of the availability of food and access to it, including all the knowledge of food safety. At the same time, in the current stage, food security is not only a health issue in terms of malnutrition, but also sustainable economic development, environmental, and trade issue.

Food consumption patterns are set using the population's income policies so it is necessary to know the two-dimensional implications and levels of expenditures ↔ food products consumption.

This aspect is discussed in this paper, starting from the quantitative aspects (progressive amounts of food products consumption and associated expenditures), to the qualitative ones (related to the level and intensity of the correlative influence of the expenditures →consumption indicators).

## 2.Materials and Methods

From a methodological point of view, in this paper, using comparative analyses, we aimed at describing, through a set of characteristics (variables), the differences/ homogeneity of the main agrifood products consumptions at national level in the interval 1998-2009. At the same time, we analysed the expenditures in terms of three levels, namely: overall household expenditures, food consumptions expenditures, the population's consumption monetary expenditures, of which the farmers' consumption monetary expenditures.

The statistical analysis at the level of indicators in physical, value and percentage units was made at the level of these indicators, as compared to the overall expenditures and the level in the reference year 1998. In the same comparative form we calculated the level of food expenditures for farmer households.

The approach to the issue required the use of methods to estimate the influence of the factors affecting the main food products consumption, and in this case we used the elasticity coefficients method. It was used in order to know the intensity of the factors (expenditures → consumption), which is why several comparative variables were taken into account, through which the food consumption is successively influenced by the overall consumption expenditures, the consumption monetary expenditures and the farmers' consumption monetary expenditures.

In the interval 2004-2009, the elasticity coefficients were calculated for the fixed comparison base (E) and the chain base (E'), the result being each variable's contribution to the food consumption evolution. The resulting phenomenon (y) was represented through the main food products consumption level, and the cause

change phenomena (x), were represented through the structural level of expenditure types. The elasticity coefficient (E) was calculated using the calculus relation:

$$E=\frac{\Delta y}{y}:\frac{\Delta x}{x}$$ The meaning of symbols:

$\Delta y$ is the absolute increase in quantifiable size for the effect phenomenon;

$\Delta x$ - , the absolute increase in quantifiable size for the cause phenomenon;

- x, y -, the basic comparison level of the quantifiable sizes for the effect, respectively cause phenomenon.

The working methodology aimed at knowing the trend in expenditures which will allow us to know the structure of the consumption level and substantiate the level of ensuring food safety in Romania.

## 3.Results and Discussions

### *3.1.The evolution of food consumption for the main food products in Romania.*

The Romanian population's food consumption is an essential and direct aspect of living conditions. Thus, a first interesting issue was the average consumption level of the main food products and especially the variation in the annual dynamics 1998-2009. In *table 1*, it is presented the status of the food consumption trend.

**Table 1.**The annual average consumption of the main food products per capita in Romania

| Product | MU | 1998 | 2000 | 2005 | 2009 |
|---|---|---|---|---|---|
| Cereal and cereal products | Kg | 221,1 | 219,7 | 214,8 | 200,8 |
| | % compared to 1998 | 100 | 99,36 | 97,15 | 90,81 |
| Potatoes | Kg | 84,1 | 86,5 | 98,0 | 93,1 |
| | % compared to 1998 | 100 | 102,85 | 116,52 | 110,70 |
| Vegetables and vegetable products | Kg | 145,9 | 134,3 | 162,6 | 168,2 |
| | % compared to 1998 | 100 | 92,049 | 111,44 | 115,28 |

| | | | | | |
|---|---|---|---|---|---|
| Fruit and fruit products | Kg | 45,8 | 44,5 | 75,9 | 62,3 |
| | % compared to 1998 | 100 | 97,16 | 165,72 | 136,02 |
| Vegetable fats | Kg | 10,0 | 13,1 | 14,6 | 16,0 |
| | % compared to 1998 | 100 | 131 | 146 | 160 |
| Milk and dairy products | Liters | 194,4 | 193,0 | 239,2 | 233,2 |
| | % compared to 1998 | 100 | 99,27 | 123,04 | 119,95 |
| Fish and fish products | Kg | 3,0 | 2,6 | 4,5 | 4,8 |
| | % compared to 1998 | 100 | 86,66 | 150 | 160 |
| Meat and meat products | Kg | 51,2 | 46,3 | 68,3 | 67,5 |
| | % compared to 1998 | 100 | 90,42 | 133,39 | 131,83 |
| Animal fats | Kg | 3,4 | 3,4 | 3,6 | 3,9 |
| | % compared to 1998 | 100 | 100 | 105,88 | 114,70 |

Data source: The Statistical Yearbook of Romania 2005-2010, NIS.

The following aspects were noticed:

- in cereals and cereal products there is an annual downward trend, the amounts for the average annual consumption decreasing by -9.19% (from 221.1 to 200.8 kg per capita);

- in other vegetal products (potatoes and vegetables/fruit products), there are differentiated annual increase trends. Respectively an upward trend in fruits and fruit products, followed by vegetables and vegetable products and potatoes (increases compared to 1998 amounting to +36.02%, +15.28% and respectively +10.70%);

- the dairy and meat products consumptions follows the same annual upward trends (from 194.4 to 233.2 litre per capita and respectively from 51.2 to 67.5 kg per capita). These levels from 2009 compared to 1998 are increases of +19.95% and respectively 31.83%;

- as for fish and fish products, the annual consumption dynamics is fluctuating. Thus, compared to 1998, in the interval 1999-2001 there was a decrease in consumption, and in the following interval there were successive increases that reach, in 2009, 4.8 kg per capita, which represents an increase of +60.0%;

- the evolution in the consumption of vegetal and animal fats for the interval 1998-2009 takes an upward trend, but at different rates. The increase in vegetal fats is very steep +60.0% (from 10.0 to 16.0 kg per capita), and in animal fats it amounts to +14.7% (from 3.4 to 3.9 kg per capita).

Synthetically, these main products in the food consumption structure reflect, on the one hand, a consumption patterns which decreases cereals and cereal products, with a significant increase in vegetal fats and fish, and an average increase in the other products. But the consumption levels are differentiated in the structure of consumer social groups. The existence of annual consumptions which record annual increase rates in vegetal and especially animal fats (of +60.0% and respectively +14.7%) reflects the amounts intended for those consumers who are below the income average (or at subsistence level), whose food purchase possibilities stagnate or even decrease.

### *3.2.The food consumption expenditures structure*

The food consumption expenditures are characterised using ways of investigating the overall expenditures annual structure and an analysis using the successive delimitation: of monetary expenditures, of those for purchasing food and the value of agricultural products consumption from own resources.

With reference to the interval 2004-2009 in *table 2* are presented these expenditure levels, also according to number of persons per household (1…6 persons).

The following conclusions may be drawn:

- the ratio of overall monetary expenditures within the overall expenditures is increasing (from 77.5% in 2004 to 84.5% in 2009);

- with slight differences, the ratio of food purchase expenditures remains the same (between 22.6% and 22.0%);

- regarding the value of agricultural products consumption there is a decrease by -7.0% (from 22.5% in 2004, to 15.5% in 2009);

- in terms of the number of persons per household we notice a minimum expenditures level for the households with only one person and maximum levels for households with over three persons. It is worth mentioning the sharp decrease in the agricultural products consumption value from own resources for all the cases related to the number of persons per household.

**Table 2.**Overall household expenditures, grouped according to number of persons in Romania (% of the overall expenditures)

| | Expenditure structure | Total | Of which: in households according to number of persons: | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 1 person | 2 persons | 3 persons | 4 persons | 5 persons | 6 persons |
| 2004 | Overall monetary expenditures | 77,5 | 75,8 | 75,8 | 82,7 | 80,4 | 71,5 | 66,4 |
| | Food purchase | 22,6 | 24,8 | 21,8 | 22,4 | 22,7 | 21,9 | 23,4 |
| | Value of agricultural products consumption (own resources) | 22,5 | 24,2 | 24,2 | 17,3 | 19,6 | 28,5 | 33,6 |
| 2005 | Overall monetary expenditures | 81,7 | 79,8 | 80,6 | 85,8 | 83,8 | 77,2 | 70,9 |
| | Food purchase | 23,0 | 24,9 | 22,6 | 22,6 | 22,6 | 23,4 | 24,7 |
| | Value of agricultural products consumption (own resources) | 18,3 | 20,2 | 19,4 | 14,2 | 16,2 | 22,8 | 29,1 |
| 2006 | Overall monetary expenditures | 83,0 | 80,8 | 81,6 | 87,7 | 84,6 | 78,5 | 73,3 |
| | Food purchase | 22,2 | 25,2 | 22,1 | 22,1 | 21,3 | 22,4 | 23,0 |
| | Value of agricultural products consumption (own resources) | 17,0 | 19,2 | 18,4 | 12,3 | 15,4 | 21,5 | 26,7 |
| 2007 | Overall monetary expenditures | 82,7 | 79,4 | 81,5 | 87,6 | 84,1 | 77,5 | 73,0 |
| | Food purchase | 22,0 | 25,1 | 21,5 | 21,6 | 21,8 | 21,6 | 22,5 |
| | Value of agricultural products consumption (own resources) | 17,3 | 20,6 | 18,5 | 12,4 | 15,9 | 22,5 | 27,0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2008 | Overall monetary expenditures | 84,6 | 82,5 | 83,9 | 88,6 | 85,9 | 79,3 | 75,5 |
| | Food purchase | 22,2 | 25,5 | 22,2 | 21,6 | 21,8 | 21,6 | 23,0 |
| | Value of agricultural products consumption (own resources) | 15,4 | 17,5 | 16,1 | 11,4 | 14,1 | 20,7 | 24,5 |
| 2009 | Overall monetary expenditures | 84,5 | 82,4 | 83,7 | 88,9 | 85,1 | 80,4 | 75,6 |
| | Food purchase | 22,3 | 25,9 | 22,0 | 21,7 | 21,6 | 22,4 | 23,5 |
| | Value of agricultural products consumption (own resources) | 15,5 | 17,6 | 16,3 | 11,1 | 14,9 | 19,6 | 24,4 |

The evolution of food consumption patterns is considered the main reason for these differentiations. This is one of the basic reasons for which the ratio of food consumption expenditures compared to overall expenditures is still taken into account. The percentage levels presented in *table 3* illustrate the comparative form aimed at comparing food purchases, agricultural products consumption from own resources and the value of agricultural products consumption from own resources in farmer households. The dynamics recorded by these levels in the interval 1998-2009 is presented in Table 3.

**Table 3.**Food consumption expenditures ratio within overall household expenditures in Romania (%)

| | 1998 | 2000 | 2005 | 2009 |
|---|---|---|---|---|
| Food purchase and consumed beverages | 23,8 | 22.,1 | 23,0 | 22,3 |
| Value of agricultural products consumption from own resources | 29,8 | 31,6 | 18,3 | 15,5 |
| Value of agricultural products consumption from own resources from own resources in farmer households | 54,7 | 60,3 | 45,0 | 44,6 |

Data source: The Statistical Yearbook of Romania 2005-2010, NIS; Overall monetary household expenditures = 100%.

The following aspects deserve to be mentioned:

- the ratio of expenditures on purchasing food and consumed beverages is slightly decreasing and reaches a minimum level in 2007 (22.0%), after which this level reaches 22.3% in 2009;

- regarding the value of agricultural products consumption from own resources, there is a huge decrease. If in 1998 the ratio was 29.8% in 2009 it reached 15.5% (therefore a decrease by -14.3%);

- the resources of agricultural products for own consumptions was monitored using the same percentage patters and a decrease was also noticed. This situation includes the very activities of the farmers' families for which this comparison in relative figures decreases by -10.1% from 54.7% in 1998 to 44.6% in 2009).

During the following stage, we raise the issue of deepening this knowledge using the comparison basis of consumption monetary expenditures. In the interval 1998-2009, there were noticed differences both in the overall consumption monetary expenditures, in purchasing food products, and in the food expenditures associated with farmer households. All these variation levels are presented both in terms of values and as percentages in *table 4.*

The following aspects were noticed:

- the existence of a high increase in consumption monetary expenditures;

- food products expenditures decrease by -8.4% (so that from a ratio of 44.1% in 1998 we arrive at 35.7% in 2009);

- the decrease in food expenditures is also maintained for farmer households but it is of only -5.0% (from 35.4% in 1998 to 40.4% in 2009).

This is how we draw the conclusion that there are differentiated annual rates for the consumption monetary expenditures on food products. Starting with the first years after the revolution, about 1/3 of the expenditures incurred by retired and employed persons derived from agriculture, therefore they were not subject to the agrifood market.

**Table 4.**The structure of consumption monetary expenditures incurred by households in Romania

| | MU | 1998 | 2000 | 2005 | 2009 |
|---|---|---|---|---|---|
| Overall consumption monetary expenditures<br>of which: | lei/person | 962602 | 1754878 | 720,27 | 1275,03 |
| of which:<br>for food products | lei | 424507,5 | 724764,6 | 264,3391 | 455,1857 |
| | % within overall expenditures | 44,1 | 41,3 | 36,7 | 35,7 |
| of which:<br>food expenditures for farmer households | lei | 222908,5 | 392472,5 | 169,83 | 306,26 |
| | % within overall expenditures | 35,4 | 37,8 | 40,8 | 40,4 |

Source: The Statistical Yearbook of Romania 2005-2010, NIS

At the next stage, the fundamental consumption in the interval 1998-2009 proves that, as compared to the overall expenditures on food products, there is an overall decrease of -8.4%, and of only -5.0% for farmers' families. All these imply substantiations related to, on the one hand, the income level which triggers higher expenditures especially on food consumptions, and on the other hand, the changes/progress from the rural to the urban consumption pattern. The differentiation in consumption patterns (rural and urban) is characterised by the access to food which is mainly limited by the household's purchasing power. At the same time, the rural pattern includes those categories of consumers who own terrain and whose food status depends both on their own production and on their purchasing power, determined by the ratio of sold products prices and the prices of products purchased on the market.

### *3.3.Analysis of the expenditures impact on consumptions for the main agrifood products*

In order to causally know the differences presented above, we consider it necessary to analyse the correlative structure of indicators, by comparison and in evolution. Through specific determinations, elasticity manages to capture the level and impact of the expenditures factor on consumption. Elasticity coefficients were calculated, estimating the impact of expenditures (farmers' overall expenditures, overall monetary ones and consumption ones) on the consumption of main food items (cereals and cereal products, milk and dairy products, fish and fish products, meat and meat products). The elasticity coefficients with fixed base (E) the year 2004 and chain base (E'), presented in *table 5*, illustrate the direction and correlative impact.

**Table 5**.Elasticity calculated according to the correlative structure between expenditures (x) and the consumption of main food items in Romania (y)

| | Cereals and cereal products | | Milk and dairy products | | Fish and fish products | | Meat and meat products | |
|---|---|---|---|---|---|---|---|---|
| | E | E' | E | E' | E | E' | E | E' |
| Correlative structures between overall household expenditures (x) and the consumption of main food items in Romania (y) | | | | | | | | |
| 2004 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2005 | -0,26 | -0,26 | 0,014 | 0,14 | 1,54 | 1,54 | 0,47 | 0,47 |
| 2006 | -0,22 | -0,27 | 0,13 | 0,25 | 0,73 | 0,18 | 1,60 | 2,01 |
| 2007 | -0,12 | -0,03 | 0,12 | 0,15 | -0,16 | -1,80 | 0,04 | -2,26 |
| 2008 | -0,08 | -0,07 | 0,08 | 0,04 | 0,03 | 0,51 | 0,02 | -0,007 |
| 2009 | -0,09 | -0,24 | -0,02 | -1,42 | 0,24 | 2,58 | 0,03 | 0,20 |
| Correlative structures between household consumption monetary expenditures (x) and the consumption of main food items in Romania (y) | | | | | | | | |
| 2004 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2005 | -0,13 | -.13 | 0,007 | 0,007 | 0,90 | 0,90 | 0,25 | 0,25 |
| 2006 | -0,16 | -0,24 | 0,099 | 0,23 | 0,55 | 0,16 | 1,14 | 2,39 |
| 2007 | -0,11 | -0,03 | 0,10 | 0,15 | -0,14 | -1,35 | 0,03 | -1,61 |
| 2008 | -0,07 | -0,05 | 0,07 | 0,03 | 0,02 | 0,43 | 0,018 | -0,005 |
| 2009 | -0,08 | -0,02 | -0,02 | -1,11 | 0,21 | 2,64 | 0,02 | 0,17 |

| *Correlative structures between farmers' consumption monetary expenditures (x) and the consumption of main food items in Romania (y)* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2004 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2005 | -0,17 | -0,17 | 0.01 | 0,01 | 1,21 | 1,21 | 0,33 | 0,33 |
| 2006 | -0,24 | -0,37 | 0,14 | 0,36 | 0,80 | 0,25 | 1,66 | 3,69 |
| 2007 | -0,14 | -0,03 | 0,14 | 0,16 | 0,18 | -1,43 | 0,04 | -1,70 |
| 2008 | -0,0,09 | -0,05 | 0,08 | 0,035 | 0,03 | 0,47 | 0,02 | -0,006 |
| 2009 | -0,0,08 | -0,09 | -0,02 | -0,50 | 0,22 | 1,19 | 0,02 | 0,08 |

From the figures presented above, the following aspects have to be mentioned:

- the interpretations of the overall household expenditures (x), on the consumption of main food items (y), show the trend through which the increase in expenditures influences the decrease in cereals and cereal products consumption (E<0; E'<0). For milk and dairy products, meat and meat products the coefficients in most years vary between 1 and 0 (1>*E*> 0; 1>*E*'> 0), which indicated a lack of elasticity (therefore the consumption level does not depend directly on the expenditures variation). In certain years, for the chain base (the comparison being relative to the previous year), there is a reverse elasticity as well (E<0; E'<0), which explains the status of the market which, for the respective products (milk, fish, meat), was favourable to the consumer;

- the influence of the household monetary expenditures (x) on the same consumer products structure (y), exhibits the same trends. In the case of cereals and cereal products, there is reverse influence (E<0; E'<0), and in the case of the other products there is lack of elasticity (1>*E*> 0; 1>*E*'> 0). By comparison to the previous years (E') there are situations in which there is reverse elasticity (E'<0), explained by the status of the market for milk, fish, meat and their derivates;

- in the case of farmer household elasticity, the correlative form of consumption monetary expenditures (x) and the product consumption (y) the impact forms are also differentiated, according to the product group. In the case of cereals and cereal products, reverse elasticity is maintained (E<0; E'<0), through which the increase in incomes influences a decrease in the consumption of such products. In the case of milk, fish, meat and their derivates, in most years, there is lack of elasticity (1>*E*> 0; 1>*E*'> 0), the consumption of such products is not influenced by the farmer household monetary expenditures.

For all products, though the two types of elasticity (E, E') there is a significant downward trend in the consumption of cereals and cereal products and a balance between expenditures and consumption in the case of milk, fish and meat, manifest in the lack of elasticity.

## Conclusions

The differences in terms of expenditures and household food consumption in Romania are the result of a set of factors, among which the reorganisation of the food consumption pattern is the triggering element. From the set of situations presented in this paper, we may synthesise the following:

(1) The consumption dynamics for the main food item reflects, on the one hand, a consumption pattern in which cereals and cereal products are decreased, with a high increase in vegetal fats and fish, and an average increase in the other products. But the consumption levels are differentiates according to the consumers' social groups. The existence of annual consumptions, which record annual growth rates in vegetal fats and especially in animal fats (of +60.0% and respectively of +14.7%), reflects, at the current stage, a need for the consumers below the average incomes (or at subsistence level) who record a stagnation or even a decrease in food purchase possibilities.

(2)The population's overall expenditures structure explains the reason for differentiations in purchasing food. Compared to the overall expenditures, those intended for food purchase record a slight decrease. A significant increase is recorded in the value of agricultural products consumption from own resources, and the same value of expenditures for farmer families indicates a slower rate of decrease. Therefore, in farmer families, food consumption from own resources is still a source of self-supply of about 50%.

(3)The structure of consumption monetary expenditures exhibits annual rates that are differentiated according to the food products destination. For the targeted stage, we emphasise that compared to the overall consumption monetary expenditures, those intended for food purchase record annual decreases, a phenomenon which is manifest at a slower rate in the case of farmer families as well. All these entail substantiations related to, on the one hand, the possibilities to earn incomes that directly influence the expenditures especially on food consumption, and, on the other hand, the changes in food consumption patterns. The differentiation in consumption patterns (traditional/modern and rural/urban) is characterised by access to food which is mainly limited by the household's purchasing power and the population's employment type. It is wirth mentioning

that the rural pattern includes those categories of consumers that own terrain and whose food status depends both on their own production and on their purchasing power, determined by the ratio of sold products prices and the prices of products purchased on the market.

(4)In a correlative pattern, the causal knowledge of the expenditure level (x) on food consumption (y), using the elasticity method, illustrates the impact of the expenditures → consumption relationship for the main products. In the general trend of increasing food consumption expenditures, there is a decrease in cereals and cereal products consumption, at a consumption level that does not depend directly on the variation of expenditures on milk, fish and meat. In certain years, for the chain base (the comparison being relative to the previous year), there is a reverse elasticity as well, which explains the actions to improve access to the markets which, for the respective products (milk, fish, meat), were favourable to the consumer.

In order to draw a significant picture of the food consumption status in Romania, it is necessary to now not only the food consumption expenditures, but also the ratio of economic, demographic dependence included in the types and levels reached by the food crisis (quantitative and qualitative ones), indicated for certain social categories of consumers.

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