

Analysis of Meat Consumption in the Context of Income Changes

Daniela Maracine

The Bucharest University of Economic Studies, Romania
maracine.danielaa@gmail.com

Abstract

The well-being of the population can be characterized by the economic indicator annual consumption of meat per capita, meat being the food that provides the body through metabolism, nutrients and energy necessary for daily activities. One of the main components in the daily diet of Romanians is home-cooked meat, Romania positioning itself on the main places for consumption at EU level. Starting from this idea, through this paper it will be analyzed the way in which changes in meat consumption were generated as incomes in Romania changed, over a period of 10 years, respectively 2010-2020. The direction and intensity of interdependence between the two selected variables will be calculated using the Pearson correlation coefficient, through the Data Analysis program.

Key words: meat consumption, meat consumption - income correlation, meat market

J.E.L. classification: D1, D16, E01

1. Introduction

The meat sector is one of the most important sectors of the food industry in Romania, with a high impact on ensuring Romania's food security. The traditions of animal breeding at national level decreased, the market being deficient, Romania being currently dependent on imports, considering the high consumption. The consumption of animal protein is much higher than that of vegetable protein, given the richer content of amino acids essential for the health of the human body. Meat consumption supports the regeneration, maintenance and growth of tissues, contributes to the improvement of vital functions in the body and the formation of antibodies, in order to defend against diseases. There is a growing trend in domestic meat consumption in recent years, the reasons being on the one hand the increase in household income and on the other hand, the reduction of the VAT rate on food and services starting with mid-2015. The purpose of this paper is to identify the level of interdependence between population income and meat consumption, using data provided by the National Institute of Statistics over the past 10 years. The data will be analyzed through the Data Analysis program - the function of determining the Pearson correlation coefficient.

2. Literature review

According to the Organization for European Economic Co-operation (OECD), the evolution of meat consumption is considered one of the indicators for living standards and consumer prices. Also, the acceleration of meat demand is largely associated with increased income.

Meat proteins have an optimal content of essential amino acids, which places them in the category of class I proteins. Thus, the inhabitants of economically developed areas cover the nutritional needs of the body especially by consuming food of animal origin, being characterized by a high level of average annual meat consumption (Gerbens-Leenes, Nonhebel and Krol, 2010).

According to Gerbens-Leenes, Nonhebel, & Krol (2010) food consumption patterns are defined as the "repeated arrangements of consumption, characterized by types and quantities of food items and their combination in dishes and meals"; additionally, income plus preferences, culture, and availability affect these patterns. Prosperous countries tend to consume more food items sourced from animals such as milk, cheese, and meat (Gerbens-Leenes, Nonhebel, & Krol, 2010).

3. Research methodology

The present paper uses comparative methods, the data provided by the National Institute of Statistics will be analyzed, related to the average total monthly income per household and the average monthly quantity of fresh meat bought by a household per person. Based on these data generated for the last 10 years, the Pearson correlation coefficient will be determined.

The aim of this study is to identify the interdependence relationship between the average total monthly income per household and the average monthly quantity of fresh meat bought by a household per person and to answer the question: Is there a direct link between the two variables? What is the direction of the relationship between the variables? To determine the answer, Data Analysis will be used based on the elements mentioned above.

4. Findings

4.1. Analysis of data on the average total monthly income per household and the average monthly quantity of fresh meat bought by a household per person

The data provided by the National Institute of Statistics are centralized in Table 1, represent the analyzed data. Thus, the first variable is the average total monthly income per household expressed in RON, and the variable and the average monthly quantity of fresh meat bought by a household per person is expressed in kilograms. The analysis period is of the last 10 years, respectively 2010-2020.

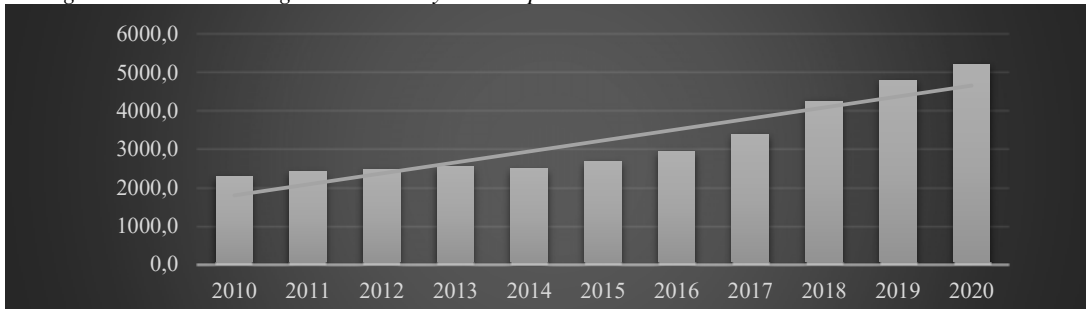
Table no. 1. The average total monthly income per household and the average monthly quantity of fresh meat bought by a household per person, period 2010-2020

Year	The average total monthly income per household (RON)	The average monthly quantity of fresh meat bought by a household per person (kg)
2010	2304,3	2,207
2011	2417,3	2,106
2012	2475,0	2,151
2013	2559,1	2,232
2014	2500,7	2,227
2015	2686,8	2,34
2016	2944,6	2,446
2017	3391,7	2,579
2018	4251,3	2,736
2019	4789,8	2,72
2020	5216,4	2,905

Source: National Institute of Statistics

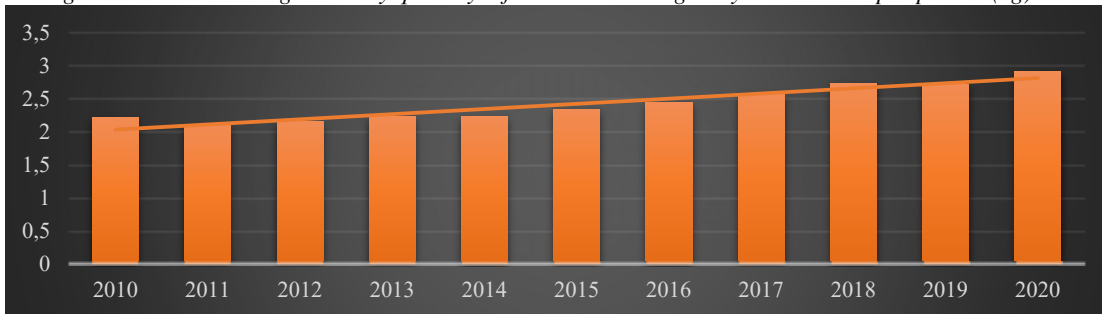
As can be seen in the table above, incomes increased by 126.37% in the analyzed period, starting from RON 2304.3 in 2010 and reaching 5216.4 RON in 2020. The evolution of revenues is upward, in the same measure also changed the amount of meat consumed, the increase being a percentage of 31.62%. The results can also be seen in the graphs below.

Figure no. 1. The average total monthly income per household



Source: data taken from National Institute of Statistics and processed

Figure no. 2. The average monthly quantity of Fresh meat bought by a household per person (kg)



Source: data taken from National Institute of Statistics and processed

4.2. Pearson's correlation coefficients determination between the average total monthly income per household and the average monthly quantity of fresh meat bought by a household per person

The Pearson correlation coefficient (R_{xy}) reveals the level of connection, association between two variables, and is calculated by the ratio of the sum of the products of the deviations to the product of the standard deviations where the coefficient sign indicates the direction. After obtaining the value of the coefficient, the sign will show us the direction of the connection between the two variables, respectively if they are directly or indirectly proportional, and the intensity will be established by approaching 1. The values of the coefficient can be between -1 and 1, thus explaining: -1 means a perfect negative correlation, 0 means a zero correlation, and 1 means a perfect positive correlation.

The formula for the Pearson coefficient is:

$$r_{xy} = \frac{\text{cov}(x, y)}{s_x \cdot s_y} = \frac{s_{xy}}{s_x \cdot s_y} = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\left[\sum_{i=1}^n (x_i - \bar{x})^2 \right] \left[\sum_{i=1}^n (y_i - \bar{y})^2 \right]}}$$

where:

- r_{xy} - Pearson correlation coefficient
- x_i — individual values of the variable
- \bar{x} — the average of individual values of x
- y_i — individual values of the variable y
- \bar{y} — the average of the individual values of y

Source: Own processing

Following the use of the Data Analysis program, the value of the Pearson correlation coefficient emerged in the table below:

Table no. 2. Coefficient of correlation between the average total monthly income per household and the average monthly quantity of fresh meat bought by a household per person

	The average total monthly income per household	The average monthly quantity of fresh meat bought by a household per person
The average total monthly income per household	1	
The average monthly quantity of fresh meat bought by a household per person	0,960312	1

Source: Own processing using Data Analysis program

It can be observed the close and direct proportional relationship between the average total monthly income per household and the average monthly quantity of fresh meat bought by a household per person, the coefficient having a value of 0.960312. This suggests that as household incomes have increased over the past 10 years, the impact has also been felt on meat consumption, which in turn has increased.

5. Conclusions

The meat industry is an important sector of the Romanian economy, given the high values of consumption manifested in the country. Viewed from another perspective, the upward trend for domestic meat consumption demonstrates the need to develop the potential of this important component of agriculture in Romania. A proper development of the food industry, correlated with the optimal use of the agricultural resources available to Romania can reduce the dependence of the domestic market on imports and ensure the food security of the nation. The potential is high, given the large agricultural area, the availability of the population to raise animals, as well as human resources in rural areas.

According to the analysis, it turned out that income is an element with a major influence on meat consumption. Incomes increased by 126.37% in the analyzed period, starting from 2304.3 RON in 2010 and reaching 5216.4 RON in 2020. The evolution of incomes is upward, in the same measure also changed the amount of meat consumed, the increase being a percentage of 31.62%.

6. References

- Andreyeva T, Long MW, Brownell KD., 2010. The impact of food prices on consumption: a systematic review of research on the price elasticity of demand for food. *Am J Public Health*, 100, p.216-222.
- Ajzen , I., 2015. Consumer attitudes and behavior : The theory of planned behavior applied to fo od consumption decisions . *Rivista di Economi Agraria* , 70 (2) , p.121-138.
- Conner , M. & Armitage , C.J., 2006. *Social psychological models of food choice*. Guildford: She pherd & M .Raats.
- DRANSFIELD, E. 2001. Consumer issues and acceptance of meat. *Proceedings of the 14th International Congress of Meat Science and Technology*, 14, p.72-79
- Food and Agriculture Organization of the United Nations, FAO, 2021. *Meat Market Review*, [online]. Available at: <<https://www.fao.org/3/cb6127en/cb6127en.pdf>> [Accessed 20 November 2021].