Analysis of Fruit Consumption in the Context of Income Change

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Abstract

Expressed in terms of income, the living standard of the population makes its mark on the current consumption needs of the household. In recent years, there has been a trend towards a balanced lifestyle, and priorities and lifestyles are changing. Through this paper, the consumption of fruits correlated with the income level will be analyzed, in order to create an image on the consumption habits, the fruits being considered a resource in the diet of the future. In order to have a clear image, the data provided by the National Institute of Statistics from the last ten years will be analyzed, including the year 2021 (first and second quarters). The Pearson correlation coefficient will be determined through the Data Analysis program.

Key words: fruit consumption, fruit comsuption-income correlation, fruit market
J.E.L. classification: D1, D16, E01

1. Introduction

According to the World Health Organization, Romania is one of the countries that is poor in fruit consumption, below the European average. Low consumption of fruits and vegetables is closely linked to poor health, the UN agency estimated that 3.9 million deaths worldwide have related to the inadequate consumption of fruits and vegetables in 2017. The paper will identify how the consumption of fruits is influenced by changes in household income, income being the defining element of living standards.

2. Literature review

According to the literature, epidemiological evidence for the health benefits of a diet rich in fruit and vegetables is substantial, a large body of epidemiological evidence suggests that a high fruit and vegetable intake helps to promote health and to prevent chronic disease. (He FJ, Nowson CA, MacGregor GA: Fruit and vegetable consumption and stroke: meta-analysis of cohort studies. Lancet. 2006). In fact, it has been mentioned that low socioeconomic position (SEP) is associated with low or less frequent intake of fruits and vegetables, and especially for family income.

3. Research methodology

This paper will use comparative methods through the Pearson correlation. With the help of data provided by the National Institute of Statistics for the period 2010-2021 (including in the year 2021 only the first and second quarters) on the average total monthly income per household and the average monthly fruits / person purchased by a household will be establish the interdependence between the two indicators. The main objective of this paper is to identify the relationship between the above variables and to answer the question: Can a relationship be established between the average total monthly income per household and the average monthly fruits / person purchased by a household? To identify the answer, it is necessary to calculate the indicators using the Data Analysis software in the Microsoft Office package.

4. Findings

4.1. Analysis of data on the average total monthly income per household and the average monthly quantities of fruit per person purchased by a household

The data necessary to analyze the influence of the two variables are centralized in Table 1 and were taken from the databases of the National Institute of Statistics. Household income is expressed in RON, the indicator being the monthly average and the unit of measurement for the average monthly amount of fruit per person is in kilograms. The reference period is 2010-2021, with the mention that in 2021 only the 1st and 2nd quarters were included. The evolution of incomes in that period was from 2304.28 RON in 2010, to 5532.34 RON in 2021.

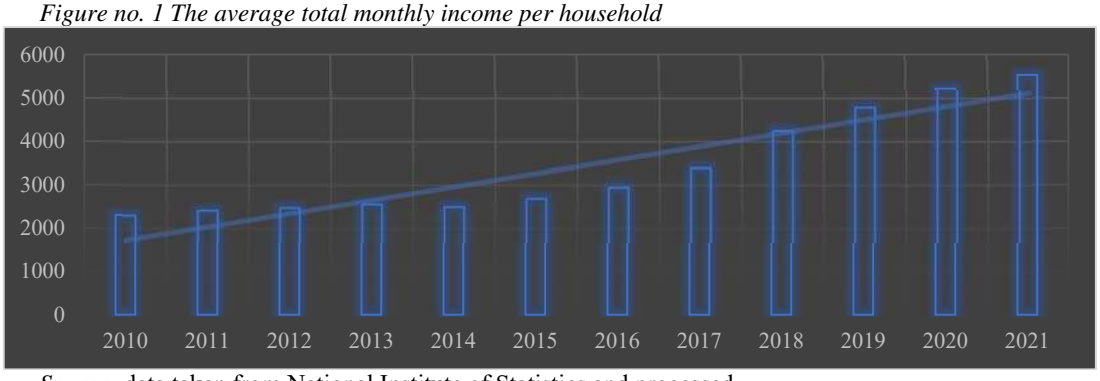
Table no. 1 The total monthly average income per household and The average monthly quantities of fruit per person bought by a household

Year	Average total monthly income per household	Average monthly quantities of fruit per person bought by a household
2010	2304,28	2,632
2011	2417,26	2,476
2012	2475,04	2,442
2013	2559,05	2,462
2014	2500,72	2,75
2015	2686,77	2,786
2016	2944,6	2,89
2017	3391,67	3,036
2018	4251,26	3,163
2019	4789,83	3,217
2020	5216,38	3,483
2021 (first and second quarters)	5532,24	3,694

Source: National Institute of Statistics

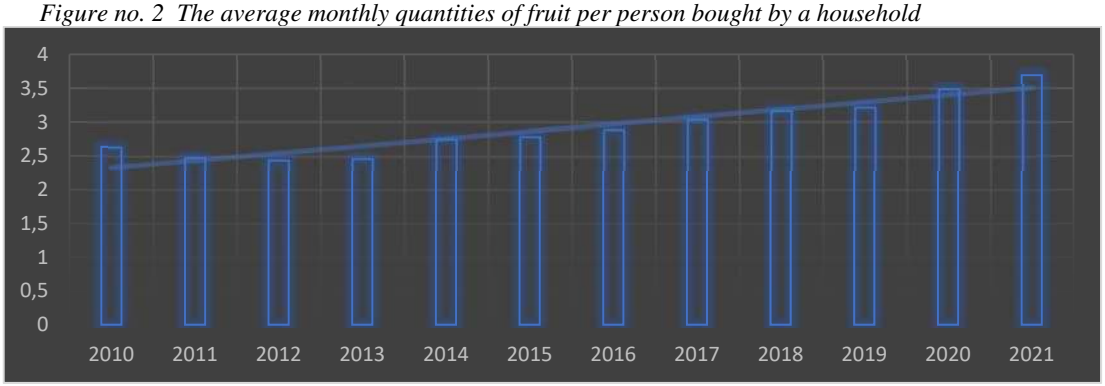
As can be seen in the table above, incomes increased by 140,08 % in the analyzed period, starting from RON 2304.3 in 2010 and reaching 5532,25 RON in 2021. The evolution of revenues is upward, in the same measure also changed the amount of fruits consumed, the increase being a percentage of 40,34 %. 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 quantities of fruit per person bought by a household



Source: data taken from National Institute of Statistics and processed

4.2. Identifying the Pearson Coefficient between Average total monthly income per household and Average monthly quantities of fruit per person bought by a household

The Pearson correlation coefficient (Rxy) 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:

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

where:
rxy - Pearson correlation coefficient
xi — individual values of the variable
$\bar{x}$— the average of individual values of x
yi — 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 Analyis 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 quantities of fruit per person bought by a household

	The average total monthly income per household	**The average monthly quantities of fruit per person bought by a household**
The average total monthly income per household	1	
The average monthly quantities of fruit per person bought by a household	0,952799	1

Source: Own processing using Data Analysis

It can be observed the close and direct proportional relationship between the average total monthly income per household and the average monthly quantities of fruit per person bought by a household, the coefficient having a value of 0.952799. This suggests that as household incomes have increased, the impact has also been felt on fruit consumption, which in turn has increased.

5. Conclusions

Fruits play an important role in terms of nutritional needs, and our priorities and lifestyle have changed. In the last century, physical activity was much more intense and part of the common lifestyle, work meant a lot of physical effort, the body needing a greater amount of protein, carbohydrates and fats, so fruit consumption was much lower.

According to the analysis performed, as the incomes increased, the amount of fruit consumed also increased, between the two there being a positive interdependence relationship, directly proportional. One of the explanations could be given by the felt need for energizing foods, with low caloric content, taking into account that most of the time the effort is made from the chair, from the office, nowadays.

Thus, the importance of fruits in the diet has changed in recent years, fruit consumption being in close correlation with the increase in income, becoming a resource in the diet of the future.

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 Healt*h, 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.
- He FJ, Nowson CA, MacGregor GA, 2006. Fruit and vegetable consumption and stroke: meta-analysis of cohort studies. *Lancet,* 367, p. 320-326.
- Xie B, Gilliland FD, Li YF, Rockett HRH, 2003. Effects of ethnicity, family income, and education on dietary intake among adolescents. *PrevMed*,36, p.30-40.