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STUDY ON MEAT CONSUMPTION IN ROMANIA IN THE PERIOD 2010-2020

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Abstract: *When we talk about the consumption of a food, we must take into account its importance for a balanced human diet, its production capacity, consumer preferences for that food and, last but not least, retail prices. Taking into account the current challenges regarding the provision of food for the entire population of the globe and its access to healthy food, the periodic analysis of these indicators is necessary to be able to develop policies and strategies at the global, regional and/or the national level. The purpose of the paper is to analyze meat consumption in Romania in the period 2010-2020, starting from the data provided by the National Institute of Statistics, in order to estimate the trend in a future time horizon.*

Keywords: *consumption, meat, urban, rural*

JEL classification: I31, O11

INTRODUCTION

The challenge of this century is to ensure the food needs for the entire population of the globe in continuous growth, while also ensuring access to healthy food (Beia S.I. et al., 2017). Another challenge is the preservation of biodiversity and combating climate change, bearing in mind that in the European Union, agriculture is responsible for producing 10% of greenhouse gas emissions. In this context, farmers in today's agriculture must produce more with less money and protect the environment. Part of the European Green Deal, the Farm to Fork Strategy provides long-term development opportunities so that farmers become champions in the fight against climate change. The "Farm to Fork" strategy must offer the possibility of strengthening the position of farmers in the food chain. This strategy must be seen as a whole, because the circular economy, bioeconomy, forestry and energy policy are closely related to the food system. (Elsi Katainen, 2020).

In the narrow sense of the terms, from the "Farm to Fork" Strategy, for a producer, the road from the farm to the fork should be as short as possible, as if we were taking the food from the plate directly to the mouth. The need for food under the conditions of compliance with food security and safety rules, makes the road "From Farm to Fork" longer, more expensive and with many restrictions for all "actors" (producers, intermediaries, consumers).

Among the products of animal origin, meat is in the first place, due to its high content in protein substances, high digestibility and adaptability to various culinary products. It is the main source of high quality protein. Its nutritional value depends primarily on its chemical composition, so on the species.

The balanced consumption of meat ensures the essential amino acids, which play a role in the formation of nucleo-proteins and enzymes that activate the vital functions and processes of the human body. From the amount of protein derived from meat, the protein provided by pork currently has the largest share, followed by beef, a fact also proven by the large shares they hold in multi-year productions (approximately 40% pork, cattle approximately 25%).

Within the livestock sector, meat represents the main production in terms of protein, quantity and value. Due to its nutritional value and its organoleptic properties, meat is a highly demanded product in the international trade of basic foods, being an important indicator of the standard of living in a country. From a trophic-biological point of view, meat is the main food with an energetic role in the human diet. Meat proteins, regardless of the species, have a high content of essential and non-essential amino acids that participate in the formation of hemoglobin, while the organs are a source of iron, the complex of B vitamins and vitamin PP, with a hematopoietic role. Meat consumption increases the resistance of the human body to infections and toxic substances, stimulates the activity of the CNS. Meat fats, consumed in moderation, serve to transport fat-soluble vitamins (A, D, E, K) (V. Sârbulescu, V. Stănescu, I. Văcaru-Opriș, Cornelia Vintilă, 1983).

MATERIAL AND METHOD

The analysis is based on statistical data provided by the INS regarding meat consumption in Romania in the period 2010-2020, calculating the statistical indicators: arithmetic mean, standard deviation, coefficient of variation, annual growth rate and linear trend equation. The formulas used to calculate these indicators are presented below:

1. For the arithmetic mean:

$$\bar{x} = \frac{\sum_{i=1}^N x_i}{N}$$

Where: \bar{x} = arithmetic mean;

x_i = value of production/consumption per number of years (i);

N = number of years

2. For the standard deviation (σ) it is calculated as a square mean of the deviations of all elements of the series from their arithmetic mean (Dănculescu Daniela):

$$\sigma = \sqrt{\frac{\sum (x_i - \bar{x})^2}{n}}$$

The root mean square deviation is a basic indicator, which is used in the analysis of variation, in the estimation of selection errors in the correlation calculation.

3. For the coefficient of variation (ν) it is calculated as a ratio between the mean squared deviation and the arithmetic mean. It is expressed as a percentage:

$$\nu = \frac{\sigma}{\bar{x}} \cdot 100$$

Meaning. The closer the value of ν is to zero, the weaker the variation, the more homogeneous the community, the average having a high degree of representativeness. The higher the value of ν , the greater the variation, the more heterogeneous the community, and the lower the significance of the mean. It is appreciated that at a coefficient above 35-40%, the average is no longer representative and the data must be separated into series of components, by groups, depending on the

variation of another grouping characteristic.

1. The annual rate of growth = $r_{2010 - 2020} = 11 \sqrt{\prod \left(\frac{p_1}{p_0} \right) - 1}$;

Where : $\prod p_1/p_0$ = the product of the indicators in the chain for the analyzed period
(Anghelache Constantin, Manole Alexandru , 2012).

2. Linear regression: $Y(x) = ax + b$

Where: a, b = coefficients or parameters of the equation;

a = the parameter of the explanatory or factorial variable defining the linear increase/decrease;

b = the free term or constant;

x = the exogenous chronological variable or time expressed in years (Necula, R., Stoian, M. and Drăghici, M., 2016).

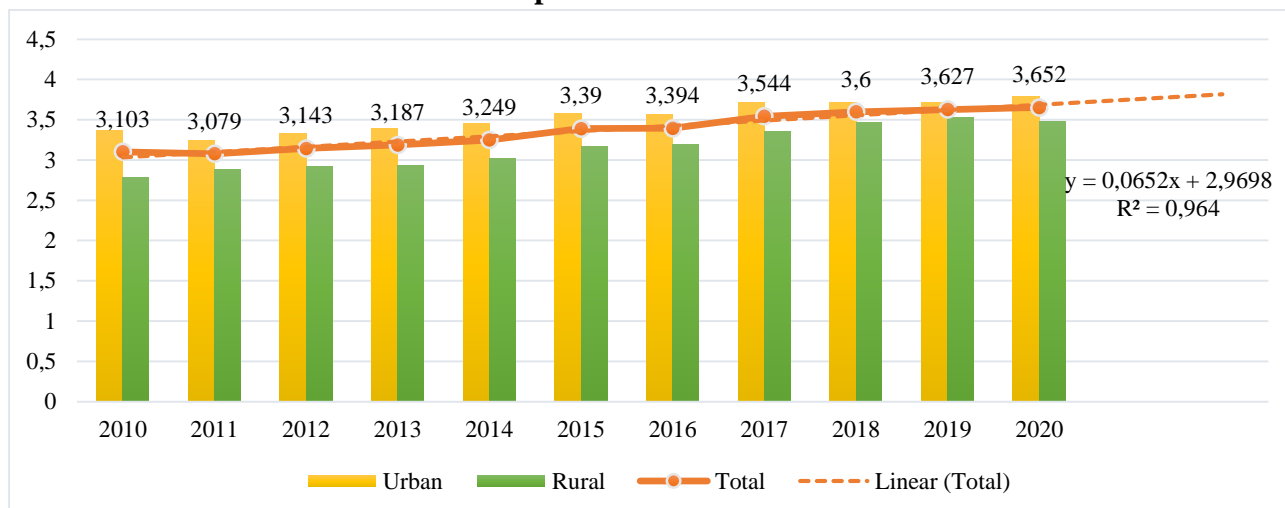
RESULTS AND DISCUSSIONS

According to statistical data, in Romania, the total production of meat in the period 2010-2020 recorded small variations (C. var= 5.6%), standing around the average of 1,305.26 thousand live weight tons. The lowest production was reported in 2013, being 1,299.53 thousand live weight tons, and the highest in 2019, being 1,494.89 thousand tons. In 2020, meat production was 11.7% higher than in 2010, but 2.5% lower than in 2019. In Romania, the average monthly consumption is approx. 3.4 kg of fresh meat, the consumption trend during the analyzed period being increasing from 3.103 kg/person/month in 2010 to 3.652 kg/person/month in 2020, the increase being 17.7%. Adjustment with the help of linear regression indicates that this consumption growth trend is maintained in 2021, reaching 3.752 kg/person/month (figure 1).

Depending on the residence environments, we observe that larger amounts are consumed in the urban environment compared to the rural environment. Thus, in 2010, in urban areas a person consumed 3.362 kg of meat monthly, and in rural areas by 0.572 kg less. Consumption increased in both residence environments, but in 2020, consumption in urban areas continued to increase compared to previous years reaching 3,793 kg/person, while in urban areas it decreased by 1.1% compared to 2019 (figure 1).

Poultry takes first place in consumer preferences, due to its more affordable price and its high digestibility at any age. In 2010, an average of 1.52 kg of poultry meat/person/month was consumed. This indicator increased during the analyzed period, 2010-2020 reaching the end of the interval at 1.629 kg/person/month (table 1).

Figure 1 Evolution of meat consumption, monthly average per person, by residence, in the period 2010-2020



Source: National Institute of Statistics of Romania

On the second place in the preferences of Romanian consumers are meat dishes, being more and more sought after, so that from an average consumption of 1.068 kg/person/month, in 2010, it increased to 4.406 kg/person/month in 2020, the increase being significant of 31.6% (table 1).

Table no.1 Evolution of average monthly meat consumption per person in Romania during 2010-2020

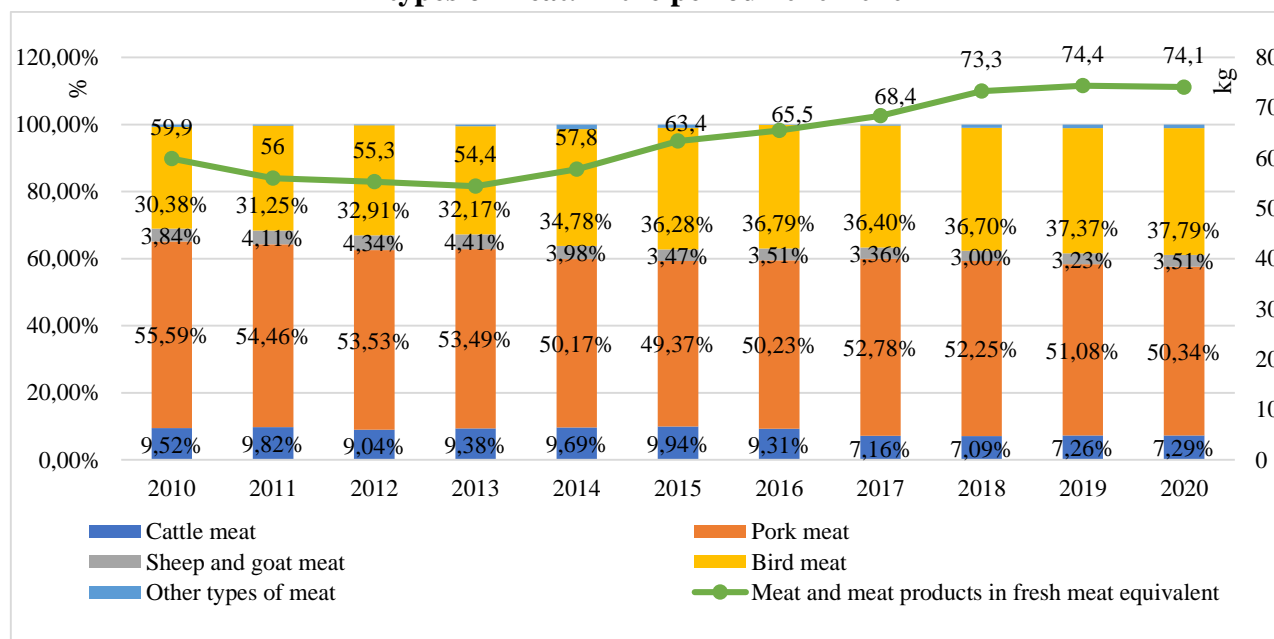
Products	2010	2011	2013	2015	2017	2019	2020	Average	Standard deviation	C.var.*	Annual rate	2020/2010	2020/2015	2020/2019	
Fresh meat, total (kg)	Kg/person/month										%	%	%	%	%
	3.103	3.079	3.187	3.39	3.544	3.627	3.652	3.4	0.2	6.5	1.6	117.7	107.7	100.7	
Beef	0.325	0.28	0.274	0.301	0.331	0.32	0.322	0.3	0.0	8.2	-0.1	99.1	107.0	100.6	
Pork meat	0.904	0.939	0.989	1.161	1.257	1.317	1.352	1.1	0.2	14.4	4.1	149.6	116.5	102.7	
Bird meat	1.52	1.522	1.58	1.591	1.593	1.615	1.629	1.6	0.0	2.3	0.7	107.2	102.4	100.9	
Meat preparations (kg)	1.068	1.023	1.031	1.101	1.202	1.238	1.406	1.1	0.1	10.7	2.8	131.6	127.7	113.6	

Source: National Institute of Statistics of Romania

The consumption of pork increased the most. so that in 2020. approximately 50% more pork was consumed compared to 2010 and 2.7% more compared to 2019. The least common assortment on the Romanians' meal is represented by beef. they consume on average only 0.3 kg/person per month. The explanation for this fact is related to the high prices of this assortment and the low purchasing power. In the period 2010-2014 beef consumption decreased from 0.325 kg/person to 0.28 kg/person. then until 2018 it increased to 0.341 kg/person. and in recent years it decreased again to 0.32 kg /the person.

Regarding the average annual consumption of meat and meat products. it can be observed that in the first years of the period the trend was one of reduction. but starting from 2014. it starts to increase. reaching a maximum of 74.4 kg/inhabitant in 2019 In the following year. the consumption of meat and its products is slightly reduced by 0.3%. still remaining at a fairly high level of 74.1 kg/inhabitant.

Figure 2 Evolution of annual meat consumption per inhabitant and the share of different types of meat. in the period 2010-2020



Source: National Institute of Statistics of Romania

According to the data of the National Institute of Statistics, pork meat is consumed in the first place, with an annual average of 37.3 kg/inhabitant, so that in 2020, it exceeds the consumption of 2010 by 12%. More than 50% of the total annual meat consumption is represented by the consumption of pork and only in 2015 it decreased to 49.7%, a fact due to the increase in the consumption of beef and poultry. The consumption of poultry meat increased a lot, so that in 2020, an inhabitant consumed an average of 28 kg annually which represents an increase of 53.8% compared to 2010. As a share of the total average annual meat consumption, poultry meat occupied in 2010, 30.38%, and with small variations it reaches 37.79% in 2020.

Table no. 2. The evolution of the average annual meat consumption per inhabitant in Romania in the period 2010-2020

Products	2010	2011	2013	2015	2017	2019	2020	Average	Standard deviation	C.var.*	Annual rate	2020/2010	2020/2015	2020/2019
	Kg/person/year										%	%	%	%
Meat and meat products in fresh meat equivalent	59.9	56	54.4	63.4	68.4	74.4	74.1	63.9	7.8	12.2	2.2	123.7	116.9	99.6
Beef	5.7	5.5	5.1	6.3	4.9	5.4	5.4	5.5	0.4	8.0	-0.5	94.7	85.7	100.0
Pork meat	33.3	30.5	29.1	31.3	36.1	38	37.3	33.2	3.6	11.0	1.1	112.0	119.2	98.2
Sheep meat goats	2.3	2.3	2.4	2.2	2.3	2.4	2.6	2.3	0.1	4.8	1.2	113.0	118.2	108.3
Bird meat	18.2	17.5	17.5	23	24.9	27.8	28	22.4	4.2	18.9	4.4	153.8	121.7	100.7
Other types of meat	0.4	0.2	0.3	0.6	0.2	0.8	0.8	0.5	0.3	64.0	7.2	200.0	133.3	100.0

Source: National Institute of Statistics of Romania

Beef is poorly represented, in 2020 the average annual consumption is 5.4 kg/inhabitant (-5.3% compared to 2010) and has a share in the total meat consumption of only 7.29%. Consumption of mutton and goat meat, although it increased by 13% in 2020 compared to 2010, it remains at a low level, an inhabitant consuming on average 2.6 kg annually, which represents approximately 3.7% of total meat consumption. As we have already mentioned, retail prices, different for each category and

for each assortment, have been on the rise in the last decade, the causes being multiple: the increase in inflation and the decrease in purchasing power, the increase in the price of energy, fuel and/or power for work. So, the purchase price of pork, at the level of Romania, has increased quite a lot in the period 2010-2020, from 4.93 lei/kg live in 2010 to 6.72 lei/kg live in 2020, representing an increase of 36.3%.

In 2020, beef was purchased at a price of 7.88 lei/kg live. There is an increase of 62.5% compared to the price of 2010 and 9.3% compared to 2019. The purchase price for sheep meat, in Romania during 2010-2020, it varied a lot with values from 5.38 lei/kg live in 2010 to 9.56 lei/kg live in 2020. For poultry meat, the purchase price started from 3.2 lei/kg live in 2010, It rose to 4.32 lei/kg live in 2013, but it decreases until 2018 to 3.56 lei/kg live. In 2020, the price for poultry meat rose to 3.81 lei/kg live, 3.8% higher compared to the previous year and 19.1% compared to 2010.

CONCLUSIONS

One of the most current problems of the economy is the appreciation and valorization of animals according to quality, seeking to harmonize existing differences between the breeders, the sellers and the processors of animals. The evaluation and valorization of animals according to carcass quality based on scientifically based criteria and methods is more recent, using meat quality assessment and coding systems.

Meat contains about 1% mineral salts, their structure varying depending on the species and its anatomical part. So, meat contains: potassium, sodium, calcium, magnesium, iron but also cobalt, aluminum or selenium. In addition to minerals, in meat we find a series of vitamins from the B complex (B1, B2, B3, B6, C and PP) and enzymes (glycolytic, phosphorylases, phosphatases, etc.). Ideally, we should consume 100 grams of red meat per day, 2 times a week and 150 g a day of white meat to bring the body's intake of minerals, necessary vitamins and enzymes. The consumption needs of the body of an adult who performs daily physical activities of medium intensity would translate into an average monthly consumption of 3.8 kg of meat, a single serving per day. It follows that it is not fully covered, average consumption in 2020 being approximately 3.65 kg.

Quality and assortment determine the selling prices. Combined with the average income of the population and its consumption preferences, with the ages of the consumers, they create an image of meat consumption in Romania in the last 10 years. In recent years, the average annual consumption of meat has increased, reaching a record level in 2019, of 74.4 kg/inhabitant. This evolution was supported by the increase in revenues and the reduction of the VAT rate (starting in 2015). Meat production in Romania exceeded 1.4 million tons in 2015, reaching a maximum level in 2019 of almost 1,495 million tons.

According to estimates, consumption exceeded Romania's production level, resorting to imports, which led to the intensification of the meat trade balance deficit. Almost 90% of meat consumption is represented by pork and poultry. Although there has been a slight increase in recent years, the consumption of sheep and goat meat is kept at a fairly low level. On the other hand, beef consumption showed a downward trend. According to studies, over 90% of Romanians consume meat at least once a week, and almost 50% almost daily. The young people preferring chicken meat, but people over 45 prefer pork. Beef is preferred by a certain category of people, being a high quality meat, more expensive than the other two. A top quality meat involves higher production costs, which is reflected in the shelf price.

The trend of recent years is to eat fresh meat, coming from the private farms or private sources with which a relationship of trust is created over time. This openness towards rural farms is also recognized by the authorities who come to the aid of farmers by establishing policies to support the sector, especially due to the fact that a decrease in the production and consumption of meat is expected in the coming years. This decrease is attributed to the decrease in purchasing power as well as changes in consumer preferences towards meat.

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