TRENDS IN PORK MARKET IN THE EUROPEAN UNION AND IN ITS MAIN PRODUCING COUNTRIES IN THE PERIOD 2007-2018

Agatha POPESCU[1,2,3]

[1]University of Agronomic Sciences and Veterinary Medicine Bucharest, 59 Marasti Boulevard, District 1, 011464, Bucharest Romania, Phone: +40213182564, Fax: +40213182888, Email: agatha_popescu@yahoo.com
[2]Academy of Agricultural and Forestry Sciences "Gheorghe Ionescu-Șișești", 61 Marasti Boulevard, District 1, 011464, Bucharest Romania, Phone: +40213184450, +40213184451, Fax: +40-21-310.49.23, Email: agatha_popescu@yahoo.com
[3]Academy of the Romanian Scientists, 3 Ilfov Str., District 5, Phone: +40213147491, Email: agatha_popescu@yahoo.com

Corresponding author: agatha_popescu@yahoo.com

Abstract

The paper analyzed pork market in the EU and in the top 10 pork producing countries in the period 2007-2018 based on the statistical data using dynamics analysis based on fixed basis index, and trend analysis based on polynomial and linear equations. The pig number declined in the EU, accounting for 148.2 million heads in 2018. In this year, there were slaughtered 259.3 million pigs from which there were obtained 23.84 million tonnes pork, by 3.8% more than in 2007. About 64% of the EU pork output is carried out in Germany, Spain, France, Denmark and Netherlands. The EU pork exports reached 3.93 million tonnes in 2018, 2 times more than in 2007. The pork imports are not significant and declined. The EU export value was double in 2018, accounting for Euro 7.3 billion, of which 71% is due to Spain, Germany, Denmark and Netherlands. The EU-28 is the top pork exporter in the world, its trade balance reached Euro 7.2 Billion in 2018, being 2.3 times higher than in 2007. The highest trade balance is registered by Spain, Germany, Denmark, Netherlands, Italy, and France. The average pork carcass price was Euro 142.04 in 2018 at the EU level. Pork is the most consumed meat in the EU, an inhabitant consuming 35 kg per year, 3 times more than the world average. As a final conclusion, the main trends which will continue in the near future in the EU pork market are the following ones: the decline in pig livestock, the slight growth of pork production, the intensification of exports, the decrease in imports and a slight decline of consumption.

Key words: *pork market, EU, production, consumption, export, import, trade balance, price, trends, forecast*

INTRODUCTION

Pork is the most preferred meat in the EU and accounts for about 50% of the total meat supply [21].

In fact pork was the most consumed meat in the world for a long period of time, and only during the last decade it passed on the 2nd position in favor of poultry meat considered healthier and cheaper than pork [10].

The EU is among the top pork producers in the world, coming on the 2nd position after China and being followed by the USA. Also, the EU is the largest pork exporter worldwide [23, 24]. The EU enlargement in 2004, 2007 and 2013 has favored the increase of the number of pigs and farms, production in pig live weight, and in carcass weight equivalent, offer, extended the free internal market among the 28 member states and also stimulated exports [17, 24]. Nowadays, the variations in pig number, pork production, consumption, demand/offer ratio, price, and trade characterize the so called "hog cycle" under the actual conditions regarding the structural and technological changes in agriculture worldwide. The analysis of the cyclical fluctuation on pork market using data from various countries, but also including the main pork producing countries of the EU, proved that "the changes in meat supply are determined by the specific condition in each country, while the changes in pork price are due to the broad convergence of cycle between countries" [22]. The changes both on the internal and regional markets concerning

demand and price in the Asian market due to the African Swine Fever, have moved the poles of attention on that market. New flows of pork amounts have started to be delivered from the main EU producing and exporting countries attracted by the high demand and price boom.
In this context, the goal of this study was to analyze the dynamics of the EU-28 pork market and in the 10 top producing countries, pointing out the main trends in the period 2007-2018 regarding pig livestock, pork production, pork price, consumption, export, import and trade balance.

MATERIALS AND METHODS

The empirical data were picked up from mainly Eurostat data base, EU Commission Reports, but also from USDA and OECD-FAO Reports. Pork market way analyzed at the EU level and also in its main pork producing countries: Germany, Spain, Denmark, Netherlands, France, Italy, Belgium, United Kingdom, Poland, Austria, and Romania.The attention was given to the following aspects: (i)pig livestock, (ii)farms structure, (iii)production cost, (iv) live weight at slaughter, (v) slaughtered number of pigs, (vi)pork production, (vii) average carcass weight, (viii) exported and imported amount of pork, (ix) pork export and import value, (x) trade balance, (xi) pork consumption, (xii) pork price. The methods used in this research included:
Dynamics analysis in the interval 2007-2018, based on the formula of the Fixed basis index: $I_{FB(\%)} = (Y_n/Y_0)100$, where: Y_n is the level of the variable X in the year n and Y_0, the value of the variable X in the year 0.
Trend line was determined using the illustration of the data in graphics and the various regression models especially polynomial, $y= ax^2 + bx +c$ and linear $y = bx +a$, according to the distribution of values.
Graphical illustration was used to present the data in a more comprehensive and easy to be understood way for the most of the indicators.
Comparison method used to analyze the obtained results allowed to emphasize the differences between the top pork producing countries in the EU. The results were presented graphically and also in tables accompanied by suitable comments. The main ideas resulting from this studied have been presented in the conclusions drawn at the end.

RESULTS AND DISCUSSIONS

The number of pigs in the EU

The fact that pork is the most preferred meat by the EU consumers explains why pig livestock is well represented among the species which supply a high quality protein for human diet.
Besides the expectations, pig number registered a general decreasing trend during the last decade. In 2018, in the EU-28, there were 148.2 million pigs, by 7.91 % less than in 2007, when their number accounted for 160.9 million. For its swine inventory, the EU comes on the 2nd position with a share of 19% after China (56.4%) in the world pig livestock which accounted for 781 million heads in 2018 [19]. The variation of the number of pigs from a year to another and the declining trend in the analyzed period have been determined by a large range of factors among which the most important ones are: herd size and growing systems existing in each member state, breed structure and its reproduction and production performances, sows livestock, number of piglets per sow at birth and weaning, feeding system, the increased price for farm inputs, the lack of subsidies for pig farming, and in addition the African Swine Fever which affected not only the Asian countries, mainly China, but also European countries such as: Romania, Poland, Bulgaria, Slovenia, Belgium, Lithuania etc [9]. The top 10 pig growing countries in the EU-28 are Spain, Germany, France, Denmark, Netherlands, Poland, Italy, Belgium, Romania and Austria, whose pig population represents 86% of the EU swine livestock, and as a consequence these countries have influenced the dynamics of the pig livestock, pork production and trade.

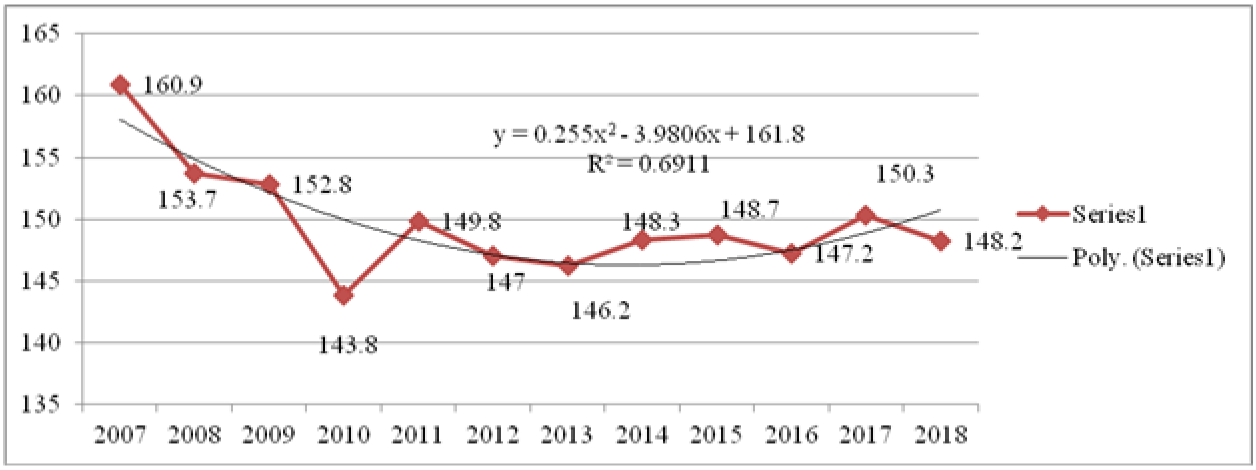

Fig.1. Dynamics of the EU-28 pig livestock, 2007-2018 (Million heads)
Source: Own design and calculation based on the data from [3].

In 2018 versus 2007, the number of pigs increased in Spain by +18.18%, Netherlands +1.91%, stagnated in Belgium at 100.14%, and declined in: Romania by - 40.21%, and Poland -37.42%, countries which were very much affected by ASF in 2018, Austria - 15.52%, France - 8.4%, Italy -8.42%, Denmark -4.01% and Germany -2.47%.

As a result, the share of the number of pigs in these countries in the EU-28 pig livestock changed in 2018 compared to 2007, the most significant variations being registered in Poland and Romania (Fig.2 and Table 1).

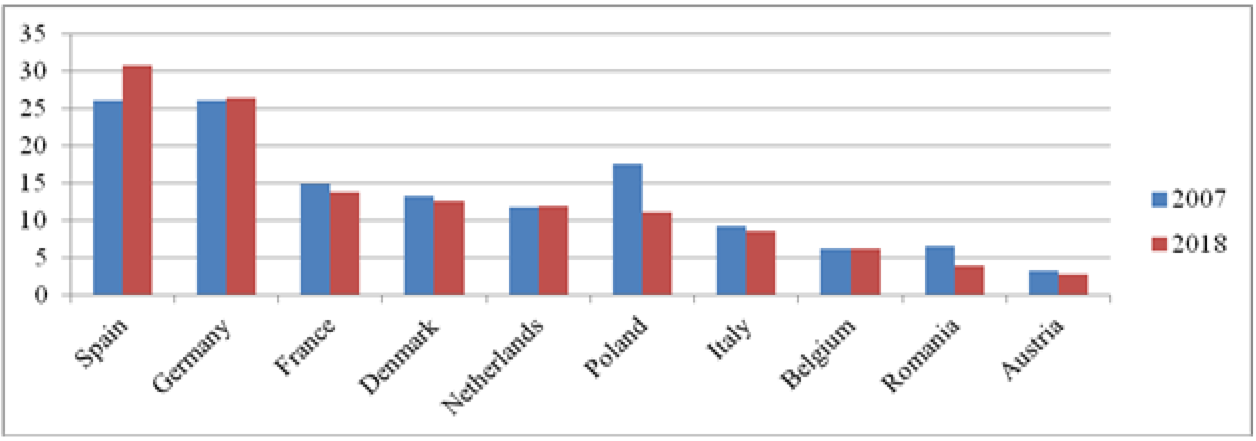

Fig.2. The number of pigs in the EU top 10 pig growing countries in 2018 versus 2007 (Million heads)
Source: Own design based on the data from [3].

Table 1.The changes in the number of pigs in the EU-28 top 10 pig growing countries, 2018 versus 2007

	Change 2018/2007 %	Share of the no. of pigs in the EU pig livestock (%)	
		2007	2018
EU-28	92.10	100.0	100.0
1.Spain	118.19	16.19	20.79
2.Germany	97.53	16.84	17.84
3.France	91.60	9.30	9.25
4.Denmark	95.99	8.18	8.53
5.Netherlands	101.91	7.28	8.05
6.Poland	62.58	10.95	7.44
7.Italy	91.58	5.76	5.73
8.Belgium	100.14	3.85	4.18
9.Romania	59.79	4.08	2.65
10.Austria	84.48	2.04	1.87

Source: Own calculations based in the data from [3].

Pig farming in the EU is running in various sized farms, most of them being small or medium sized holdings. About 85.5% of the number of farms in the EU are raising 1-9 pigs and just 1.6% of the number of farms are growing over 1,000 pigs (Fig.3). The smallest farms raising 1-9 pigs being in Romania (98.8%), Bulgaria (97.2%), Lithuania (97.2), Latvia (93.1%), Portugal (92.9%) and Hungary (90.6%) and the lowest number of small farms are in Finland (3.8%), Netherlands (5.4%), Denmark (65%) and Belgium (6.6%). The largest farms raising over 1,000 pigs are in Denmark (69.6%), Netherlands (51.2%) and Belgium (45.1%) [20].

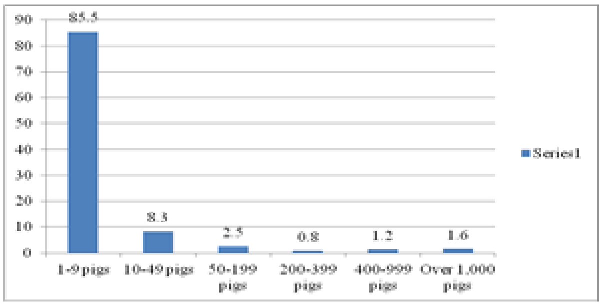

Fig.3.Pig farm structure based on the herd size in 2017(%)
Source: Own design based on the data from [20].

The raising system and the farm inputs price have a deep impact on production cost, an important factor which is permanently controlled by farmers in close connection with the price offered per kg live weight by processors at delivery.

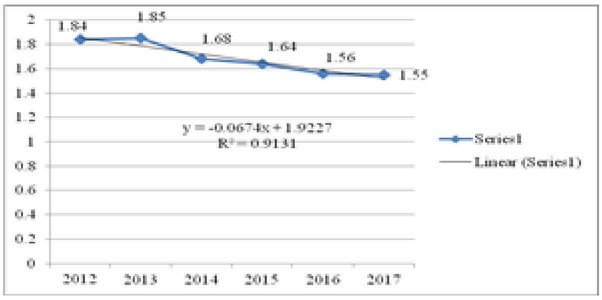

Fig.4.The average production cost in pig farming (Euro/kg deadweight)
Source: Own design based on the data from [1].

The EU average product cost in pig growing varied between Euro 1.84/kg dead weight in 2012 to Euro 1.55/kg in 2017, meaning a decline of 15.77% (Fig.4.). In general, in all the main pig growing countries of the EU, pig production cost declined during the last year as follows: in Denmark by -20.2%, Belgium -18.3%, United Kingdom -18.3%, Spain -17%, Germany -15.2%, Austria -11.2%, Netherlands -7.2%, France - 7.1%, and Italy - 5.1%. In 2018, the highest production cost was noticed in Italy, accounting for Euro 1.88/kg and the lowest cost was registered in Denmark, Euro 1.35/kg (Fig.5).

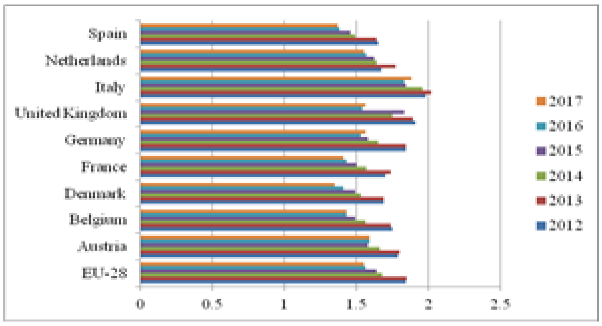

Fig.5.Dynamics of pig production cost in the EU and the main growing countries (Euro/kg deadweight)
Source: Own design based on the data from [1].

Within the production cost, the variable costs have the highest share which varied between 83.2 % in Spain, the highest level and 70.4% in Austria, the lowest level in the year 2017. Feed is the most costing item which has a deep impact on production cost. Its share in production cost ranged between 54.6%, the lowest level in Austria, and 66.6% in Spain, the highest level [1].

The average live weight at slaughter is about 120 kg, varying between 168 kg in Italy and 109 kg in United Kingdom. Its level depends on the used breeds and cross breeds, fattening system, feeding, and daily gain (Fig.6).

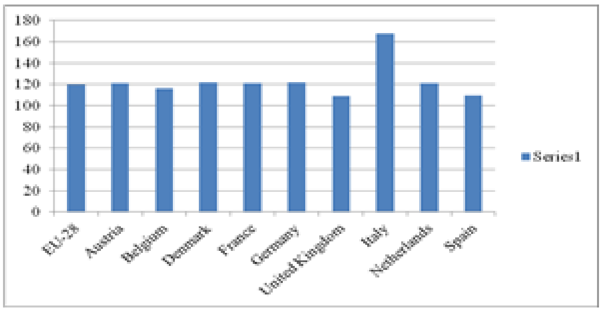

Fig.6. Pig average live weight at slaughter in the EU and the main growing countries in the year 2017 (kg/ pig live weight)
Source: Own design based on the data from [1].

The slaughtered number of pigs increased in the EU, both from internal sources and from import.

In 2018, it accounted for 259,317 thousand heads, of which 85.32% were slaughtered in the top 10 pig growing countries.

The share of the slaughtered pigs in these countries in the EU-28 slaughtered pigs in 2018 was the following one: Germany 21.8%, Spain 20.2%, France 9.05%, Poland 8.7%, Denmark 7%, Netherlands 6.15%, Belgium 4.3%, Italy 4.3%, Austria 2% and Romania 1.6% (Fig.7).

Pork production increased in the period 2007-2018 by 3.8% from 22,972 thousand tonnes in 2007 to 23,846 thousand tonnes in 2018 (Fig.8).

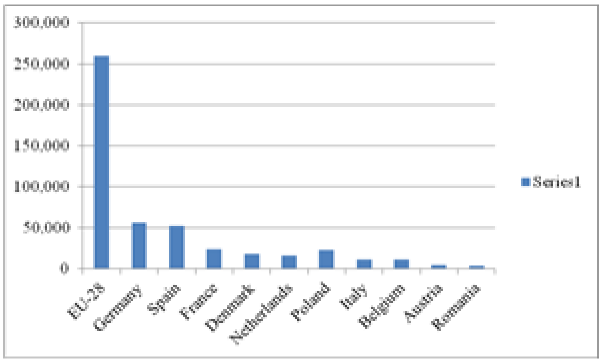

Fig.7.The number of slaughtered pigs in the main growing countries of the EU in 2018 (Thousand heads)
Source: Own design based on the data from [3].

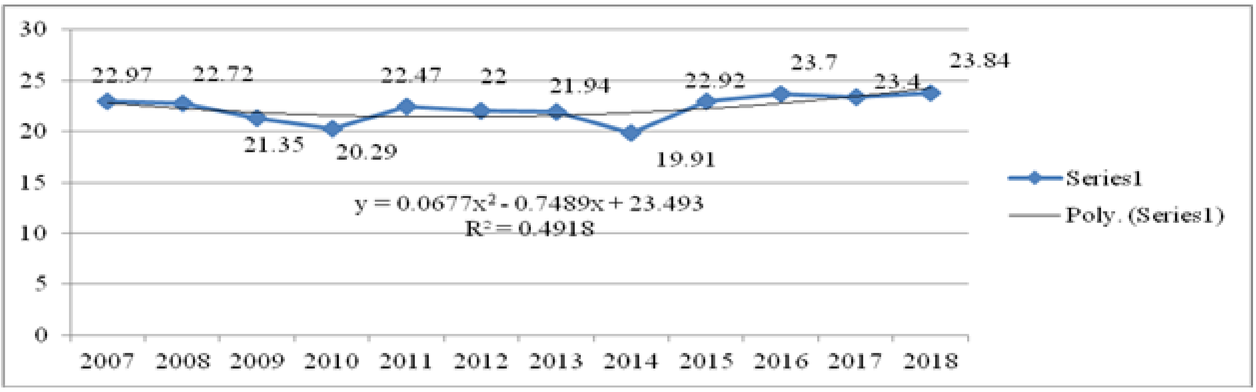

Fig.8.Dynamics of the EU-28 pork production, 2007-2018 (Million tonnes)
Source: Own design based on the data from [3, 5, 6].

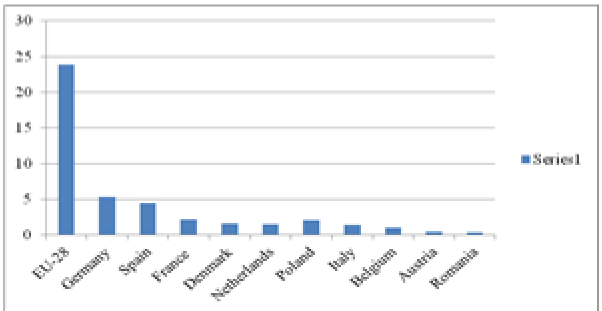

Fig.9. Pork production in the EU-28 and the top 10 main producing countries in 2018 (Million tonnes)
Source: Own design based on the data from [4].

In 2018, the highest pork production was achieved by Germany, followed by Spain, France, Denmark and Netherlands, which together produced 15,172 thousand tonnes, representing 63.6% of the EU-28 pork output.

The contribution of the top 10 producing countries to the EU-28 pork output in 2018 was the following one: Germany 22.4%, Spain 19%, France 9.2%, Poland 8.7%, Denmark 6.6%, Netherlands 6.4 %, Italy 6.2%, Belgium 4.5%, Austria 2.1% and Romania 1.6% (Fig.9).

The EU-28 is ranked the 2nd in the world after China for its performance in pork production. Its contribution to the global pork output accounted for 21.3 % in 2018 compared to 47.8% China and 10.57% the USA. About 79.3% of the global pork production is achieved by China, EU and USA [24, 25].

The average carcass weight in the EU accounted for 93 kg in the year 2017, reflecting a slaughtering rate of 77.5%. The average pork carcass weight is higher than the EU average in almost all the pig growing countries, except United Kingdom and Spain, where it accounts for 83 kg, reflecting a slaughtering rate of 76.1% and, respectively, 75.4% (Fig.10).

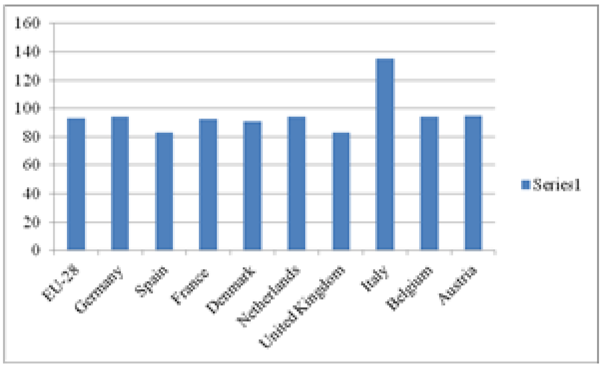

Fig.10.The average carcass weight-cold in the main EU pork producing countries, 2017 (kg)
Source: Own design based on the data from [1].

Pork export, import and trade balance

Pork exported and imported quantities

The EU-28 is an important pork exporter in the world, a fact reflected by the level of the amount of exported pork which are increasing year by year. But, the EU imports just small amounts of pork which are in a continuous decline [2].

In 2018, the EU-28 exported 3,939 thousand tonnes pork by 93.91 % more than in 2007 and imported only 34.1 thousand tonnes, by 30.8% less than in 2007. The highest exported amount was 4,239 thousand tonnes in 2016 and the highest imported amount of pork was registered in 2008 and accounted for 71 thousand tonnes.

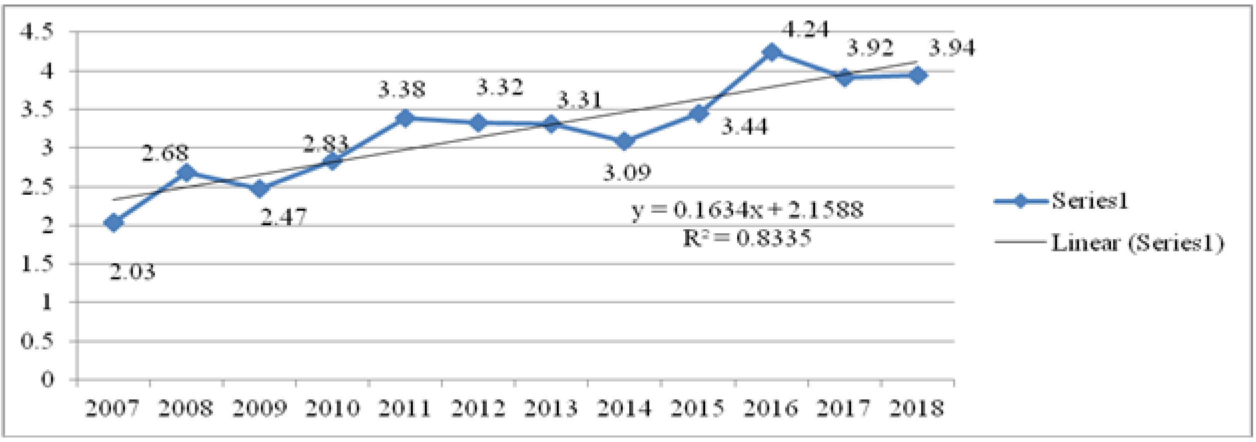

Fig.11.Exported pork amounts by the EU-28, 2007-2018 (Million tonns CWE)
Source: Own design based on the data [2, 7].

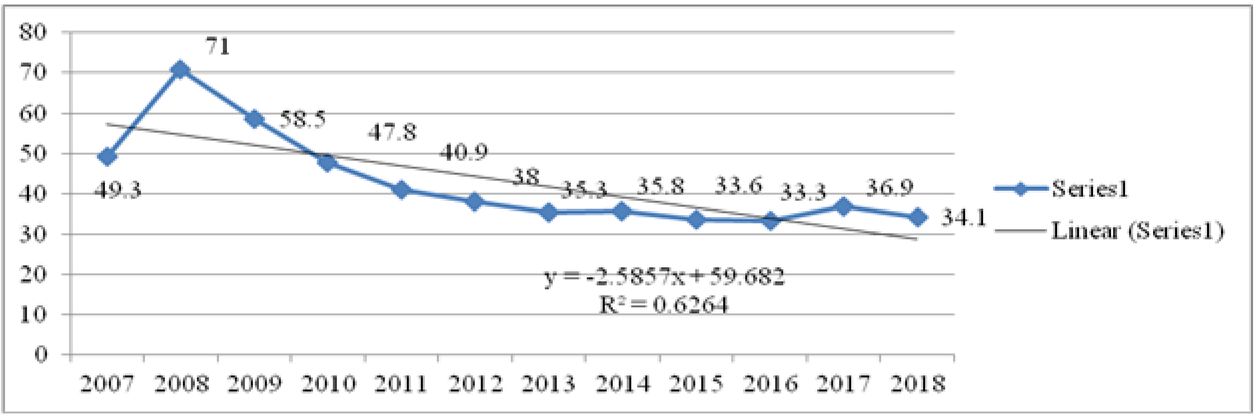

Fig.12. Imported pork amounts by the EU-28, 2007-2018 (1,000 tonns CWE)
Source: Own design based on the data [2, 7].

The top pork exporting countries in the EU are: Germany 22.6%, Spain 22.1%, Denmark 14.9%, Netherlands 12.2%, summing 71.8% of the EU exports in 2018.

In the same year, the top pork importing countries were Germany 53.1%, Netherlands 5.9%, Denmark 6.45, and United Kingdom 5%, totalizing 70.4% of the EU imports (Table 2).

Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development
Vol. 20, Issue 1, 2020
PRINT ISSN 2284-7995, E-ISSN 2285-3952

Table 2. Pork exported and imported amounts in the EU and the top producing countries in 2018 versus 2007(Thousand tonnes)

	Pork exported quantity (Thousand tonnes)				Pork imported quantity (Thousand tonnes)			
	2007	2018	2018/2007%	Share in the EU-28 in 2018 %	2007	2018	2018/2007%	Share in the EU-28 in 2018 %
EU-28	2,031	3,939	193.9	100	49.3	34.1	69.2	100.0
Belgium	108.0	75.9	70.3	1.9	N.d.	N.d.	N.d.	N.d.
Denmark	600.0	585.5	97.6	14.9	1.2	2.2	183.3	6.4
Germany	334.6	891.6	266.5	22.6	13.7	18.1	132.1	53.1
Spain	166.3	869.7	522.9	22.1	1.0	0.3	30.0	0.9
France	187.0	231.6	123.8	5.9	4.4	1.0	22.7	2.9
Italy	52.6	103.4	196.6	2.6	10.1	0.9	8.9	2.6
Netherlands	212.7	480.0	225.6	12.2	2.5	2.0	80.0	5.9
Austria	69.1	49.1	71.0	1.2	2.7	0.4	14.8	1.2
Poland	78.8	252.6	320.5	6.4	1.6	0.3	18.7	0.9
United Kingdom	22.5	146.4	650.7	3.7	5.9	1.7	28.8	5.0
Total	1,821.6	3,685.8	201.2	93.6	43.1*	26.9*	62.4*	79.8*

Note:*Except Belgium.
Source: Own calculations based on the data from [7].

The value of the EU-28 pork export, import and trade balance

The pork export value increased 2.27 times in the analyzed period from Euro 3.2 Billion in 2007 to Euro 7.3 Billion in 2018 (Fig.13).

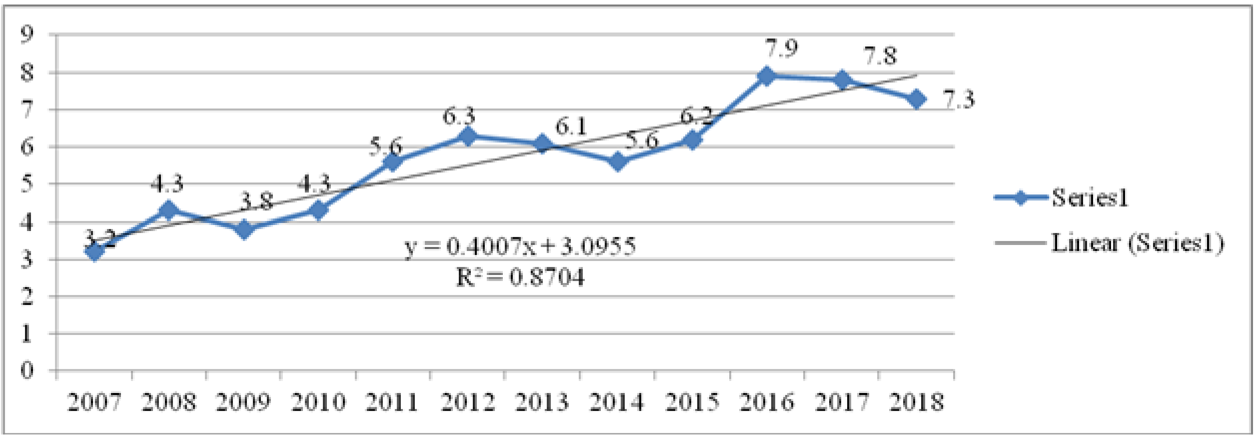

Fig.13. Dynamics of the EU-28 pork export value, 2007-2018 (Euro Billion)
Source: Own design based on the data from [7].

The highest export value is registered by Spain, followed by Germany, Denmark and Netherlands, all these four countries together contributing by 71% to the EU-28 pork export value in 2018.

In the period 2007-2018, the pork export value increased 8.3 times in United Kingdom, 6.27 times in Spain, 4.7 times in Germany and 3.3 times in Poland, 2.9 times in Netherlands, 2.5 times in Italy, 1.5 times in France and only one time in Denmark and by 18.3% in Belgium (Table 3).

The import value is very low and registered a decreasing trend so that in 2018, it accounted for Euro 0.62 Billion, being by 21.6% lower than in 2007 (Fig.14).

The import value is much lower than export value in the main producing countries. the highest pork import value is in Germany, followed by Denmark, France, United Kingdom, but also in Italy and Spain, these six countries contributing by 66.4 % to the EU pork import value.

In 2018 compared to 2007, the import value increased 4 times in Netherlands, 2 times in

Austria, 1.6 times in Denmark, 1.4 times in Spain, and 1.1 times in Germany. But, in the other producing countries, it decreased as follows: France =34%, Italy -74.7%, Poland -94.6%, United Kingdom -56.6% (Table 4).

Table 3. Dynamics of the pork export value in the main EU producing countries, 2018 versus 2007 (Euro Million)

	2007	2018	2018/2007%	Share in 2018 in the EU export value %
EU-28	3,198	7,274	227.4	100.0
Belgium	130.8	106.9	81.7	1.5
Denmark	1,189	1,254	105.5	17.2
Germany	287.5	1,379	479.6	18.9
Spain	273.8	1,719	627.8	23.6
France	253.3	400.6	158.1	5.5
Italy	175.5	441.1	251.3	6.1
Netherlands	284.5	825.0	290.0	11.3
Austria	130.3	119.0	81.3	1.6
Poland	106.2	359.3	338.2	4.9
United Kingdom	24.5	205.0	836.7	2.8
Total	2,855.4	6,808.9	238.5	93.6

Source: Own calculations based on the data from [7].

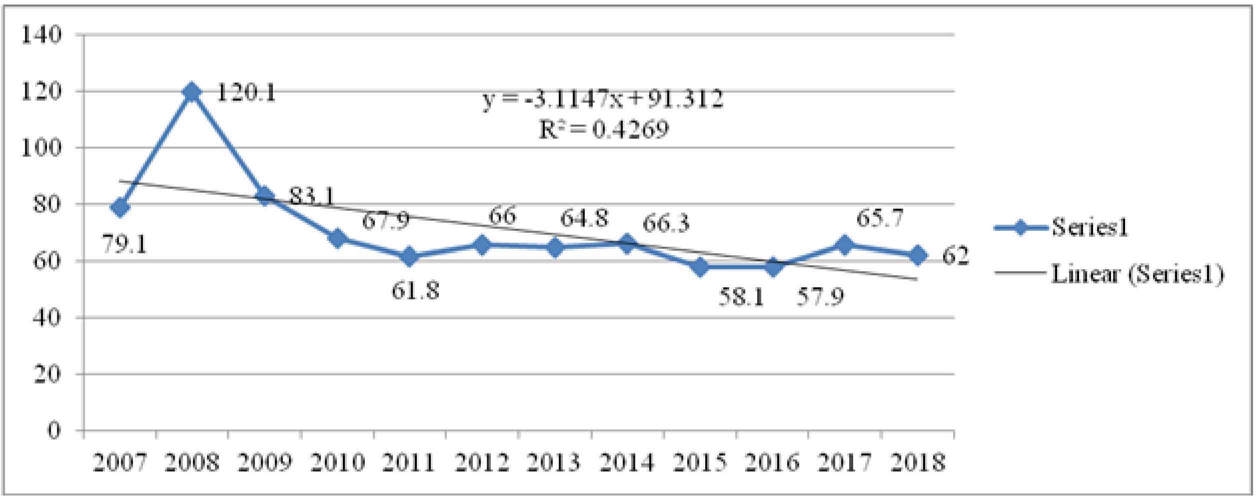

Fig.14. Dynamics of the EU-28 pork import value, 2007-2018 (Euro Million)
Source: Own design based on the data from [7].

Table 4. Dynamics of the pork import value in the main EU producing countries, 2018 versus 2007 (Euro Million)

	2007	2018	2018/2007%	Share in 2018 in the EU import value %
EU-28	79.1	62.0	78.3	100.0
Belgium	N.d.	N.d.	N.d.	N.d.
Denmark	4.6	7.5	163.0	12.1
Germany	12.1	14.0	115.7	22.6
Spain	2.5	3.6	144.0	5.8
France	10.0	6.6	66.0	10.6
Italy	15.4	3.9	25.3	6.3
Netherlands	0.5	2.0	400.0	3.2
Austria	1.4	2.8	200.0	4.5
Poland	3.7	0.2	5.4	0.3
United Kingdom	12.9	5.6	43.4	9/0
Total*	63.1	46.2	73.2	74.5

Note:*without Belgium
Source: Own calculations based on the data from [7].

As a result of the dynamics of the pork export and import values, the EU-28 pork trade balance was a positive one in each year and increased 2.31 times from Euro 3.1 Billion in 2007 to Euro 7.2 Billion in 2018 (Fig.15).

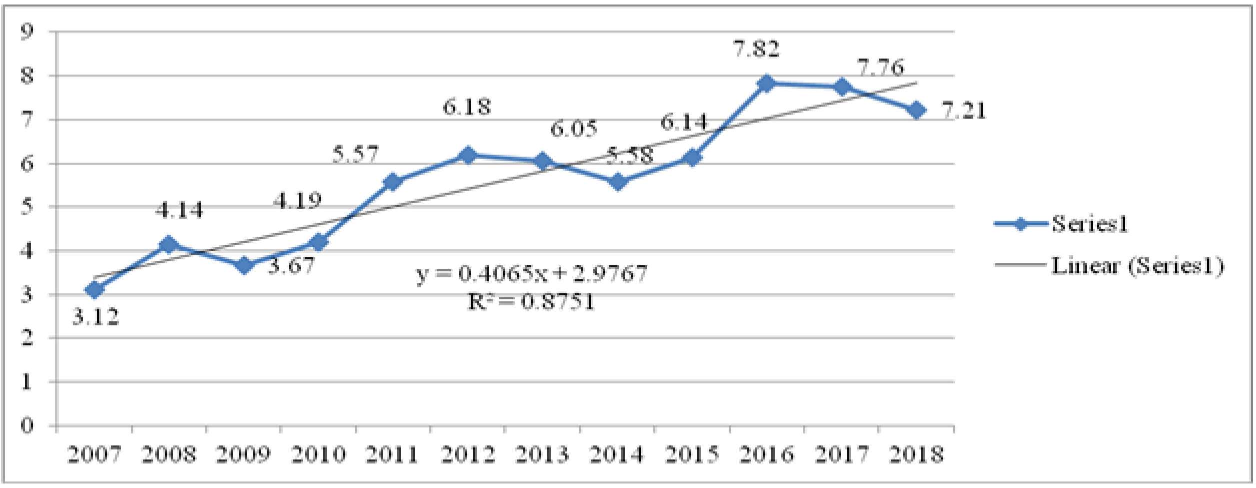

Fig.15. Dynamics of the EU-28 pork trade balance, 2007-2018 (Euro Billion)
Source: Own design based on the data from [7].

In all the main pork producing countries if the EU-28, pork trade balance is a positive one, reflecting that these states are net exporting countries.

The highest trade balance is registered by Spain, Germany, Denmark, Netherlands, followed by Italy, France and Poland, all these six countries contributing by 88% to the EU-28 pork trade balance.

In 2018, pork trade balance was higher compared to 2007 in almost all the main producing countries.

The highest growth rate was registered by Spain +6.3 times, Germany +4.9 times, Poland +3.5 times, Netherlands +2.9 times, Italy +2.7 times, only in Austria, trade balance declined by about 10% (Table 5).

Table 5. Dynamics of the pork trade balance in the EU-28 and the main producing countries in 2018 versus 2007 (Euro Million)

	2007	2018	2018/2007%	Share in 2018 in the EU pork trade balance value %
EU-28	3,118.9	7,212	231.2	100.0
Belgium	N.d.	N.d.	N.d.	N.d.
Denmark	1,184.4	1,246.5	105.2	17.3
Germany	275.4	1,365.0	495.6	18.9
Spain	271.3	1,715.4	632.3	23.8
France	243.3	394.0	114.8	5.5
Italy	160.1	437.2	273.1	6.1
Netherlands	284.0	823.0	289.7	11.4
Austria	129.9	116.2	90.1	1.6
Poland	102.5	359.1	350.3	5.0
United Kingdom	11.6	199.4	1,718.9	2.8
Total*	2,662.5	6,655.8	249.9	92.2

Note:*without Belgium
Source: Own calculations based on the data from [7].

Among the most important pork growing and producing countries is also Romania, as mentioned before considering the pig livestock and the number of farms. Despite of the high potential for producing pork, in Romania this sort of meat being on the top position as it is a traditional meat preferred by consumers, the decline of the pig number, the small sized farms where pigs are traditionally grown, the breed structure, the problems related to the increased prices of the farm inputs, the lack of subsidies in pig sector, the health pig problems in a few farms due to the African Swine Fever mainly in the last two years 2018 and 2019, have affected the livestock and slaughtering performance, and also pork trade.

Romania is facing "a pork market crisis" characterized by the lack of biological material, in terms of sows to produce piglets, so that it is a lack of piglets and their price increased. The increased production cost determined a higher price at the farm gate, a nonconvenient situation for pig slaughtering houses which have intensified the imports of pigs and pork carcasses to assure a cheaper raw material.

The outbreak of the ASF in Asia, mainly in China determined a high growth rate of pork demand and the boom of pork price, which represent a real opportunity for the EU most important producing and exporting countries to intensify pork production and sell especially on the China market. In this purpose, they decided to limit the supply of sows, piglets and carcasses on the EU market.

Under these conditions, the Romanian farmers are not able to assure the needed piglets for covering the fattening capacity and the processors are not able to assure the raw material in terms of carcasses for covering the processing capacity.

The health problems caused by the classic pig fever and in addition determined by the ASF, reduced the chance of Romania to be among the top pork exporting countries of the EU [11, 12, 13, 14, 15, 16, 18].

Average annual pork carcass price increased from Euro 135.17/100 kg carcass Grade E in 2007 to Euro 142.04 in 2018, meaning a growth rate of 5.08%.

However, in 2019, pork carcass price reached Euro 169.08%, meaning +19.03% more than in 2018. This was caused by the high demand of pork in the Asian market, especially in China, which intensified the exports of the EU main exporting countries on this market where pork price has exploded. In this way, the EU market is facing the pork crisis, characterized by the lack of piglets and the lack of pork carcasses.

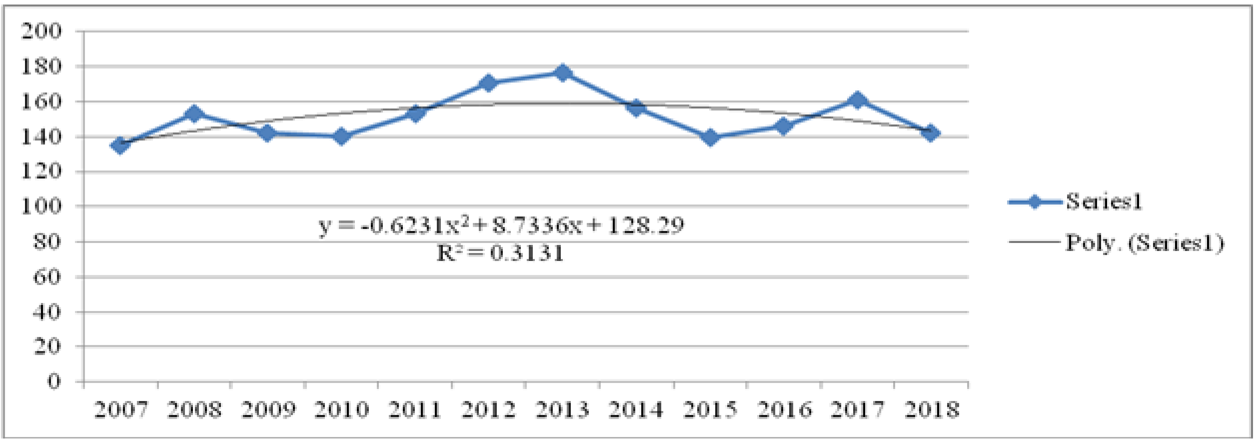

Fig.16.Dynamics of the average annual pork carcass Grade E price in the EU-28 (Euro/100 kg carcass)
Source: Own design based on the data from [2, 3].

In 2018, in the main EU pork producing countries, the average pork carcass price was higher than in 2007 by +16.5% in Italy, +8.7% in Denmark, +8.6% in Poland, +7.9% in Austria, +4.9 % in Germany, +2.4% in France, and +2.2% in Netherlands.

In the same year, in other countries, the average carcass price was lower than in 2007 like in: Belgium -10.3%, Romania -0.7%, and Spain -0.35%.

The highest average carcass price accounted for Euro 168 in Italy and the lowest price Euro 116 in Belgium in 2018. In 2019, the carcass price registered a boom in the main EU producing countries. The growth rate in 2019 compared to 2018 was +28.4% in

Denmark, +25.3% in Netherlands, +22.8% in Belgium, +21.6% in France, +21.5% in Germany, +19.6% in Spain, +19.3% in Poland, +18.1% in Austria and +15.4% in Romania. In 2019, the highest carcass price accounted for Euro 177.5 in Germany and the lowest price Euro 142.5 in Belgium (Table 6).

Table 6.Average annual pork carcass Grade E price in the top EU producing countries, 2007-2019 (Euro/100 kg carcass)

	2007	2010	2013	2016	2018	2018/2007 %	2019	2019/2018 %
Belgium	129.2	130.3	159.6	129.1	116.0	89.7	142.5	122.8
Denmark	117.7	126.3	159.3	136.8	128.0	108.7	164.4	128.4
Germany	139.1	144.4	174.8	151.8	146.0	104.9	177.5	121.6
Spain	139.1	145.7	195.6	139.4	138.8	99.7	166.1	119.7
France	127.7	129.9	165.4	138.8	130.8	102.4	159.1	121.6
Italy	144.2	150.2	188.9	159.6	168.0	116.5	N.d.	-
Netherlands	123.6	128.8	158.2	132.0	126.3	102.2	158.3	125.3
Poland	128.4	134.9	174.8	145.0	139.5	108.6	166.5	119.3
Austria	137.8	137.8	172.9	150.0	148.7	107.9	175.7	118.1
Romania	151.1	153.4	184.6	145.2	150.0	99.3	173.1	115.4

Source: Own calculations based on the data from [4].

Pork consumption is slightly decreasing despite that pork is the most consumed meat, being followed by chicken, beef and veal and sheep meat. At present, the EU population's needs are covered by the internal production, the self sufficiency rate being 110 % [6].

In 2019, the population of the EU consumed 20,685 thousand metric tonnes of pork (carcass weight equivalent, CWE), by 0.9% less than in 2015 and by 2.3 % less than in 2018.

The EU-28 pork consumption represents 19.6% of the world pork consumption, the EU being situated on the 2nd position after China from this point of view.

While in the EU pork consumption is declining, in the USA it is increasing (Fig.17).

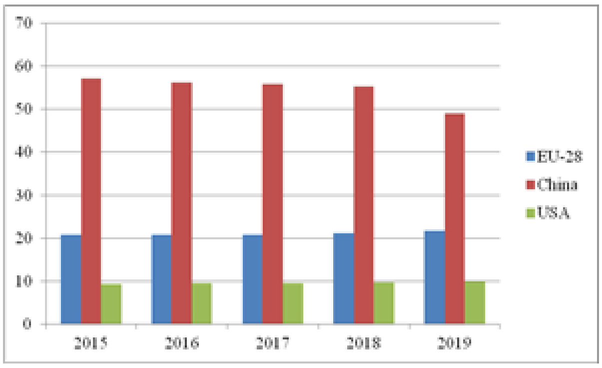

Fig.17.Dynamics of pork consumption in the EU compared to pork consumption in China and in the USA, 2015-2019 (Million tonnes)

Source: Own design based on the data from [25].

The decline in pork consumption in the EU is caused by many reasons such as:

-the tendency of the people to shift towards vegetables considered by doctors and nutritionists as a healthier source of protein than the protein of animal origin;

-the need to assure the environment protection and take into consideration the climate change caused by the gases released by animals;

-the ageing of the population in the EU will determine a lower consumption of food per capita;

-the decline of pork production expected on the internal EU market in the next years;

-the increased preference of the EU consumers for poultry meat which contains high value protein, less cholesterol and it is cheaper than pork;

-the slight growth in the sheep meat demand due to the desire of a diversified diet and changes in the EU population structure taking into account the religious beliefs and migration during the last years.

Taking all these reasons into consideration and based on the statistical data, it is expected as in 2020 the total meat consumption in the EU to reach 69.8 kg/inhabitant, of which pork 31.3 kg, poultry meat 25.6 kg, beef and veal 10.8, and 1.8 kg sheep meat.

The forecast for 2030 is that an EU inhabitant will consume 68.7 kg meat, of which pork 30.2kg, poultry 26.6 kg, beef 10 kg and sheep

meat 1.8kg. Therefore, pork consumption will decline in favor of poultry meat.
Also, in 2030, it is prospected that pork production and consumption to decline by 8%, and, respectively by18%, while pig farm gate price to increase stimulating farmers to produce more for the external markets, the pork export being expected to double its figure in 2030 and the import to stagnate [2].
Table 7 presents the images of the future situation of the EU meat supply balance for the 2028 horizon. The figures show the trends mentioned above regarding pork production import, export and consumption (Table 7).

Table 7.The forecast of the EU Meat Supply Balance for the 2028 Horizon

		Production (kt CWE)	Import (kt CWE)	Export (kt CWE)	Consumption (kt CWE)	Consumption per capita (kg RWE/capita)
Meat	2016-2018	43,462	3.05	6,002	39,015	70.3
	2028 Forecast	43,986	1.48	6,206	39,209	70.9
Pork	2016-2018	22,872	156	3,168	19,842	35.0
	2028 Forecast	22,886	167	3,275	19,761	34.8
Poultry	2016-2018	12,839	864	2,247	11,712	23.3
	2028 Forecast	13,640	923	2,380	12,182	24.2
Beef and veal	2016-2018	7,141	379	546	6,749	10.7
	2028 Forecast	6,826	375	496	6,518	10.3
Sheep meat	2016-2018	610	114	41	713	1.4
	2028 Forecast	634	201	55	747	1.5

Source: [8].

CONCLUSIONS

This study pointed out the role and importance of the EU as pork producer and exporter, and this is sustained by the performance carried out in the top producing countries: Germany, Spain, Denmark, Netherlands, France, Italy, Belgium, Poland, Austria, United Kingdom and Romania.
The pig number declined by 8% at the EU level being determined by the reduction of pig population in the main growing countries analyzed in this study, except Spain, Germany and Netherlands.
About 65% of the EU pig livestock is grown in Spain, Germany, France, Denmark and Netherlands.
The largest farms raising more than 1,000 pigs are in Denmark, Netherlands and Belgium, but they represent only 1.6% of the EU pig farms, while 85.5% farms are small sized holdings raising less than 1o pigs.
Production cost declined reaching Euro 1.55/kg deadweight. The share of the variable costs exceeds 70 % and feeding cost represents at least 55 % in the production cost.
About 85% of the number of slaughtered pigs in the EU are slaughtered in the top 10 producing countries, of which 67% are slaughtered in five countries: Germany, Spain, France, Poland, and Denmark.
From the 259.3 million slaughtered pigs in 2018 it was obtained 23.84 million tonnes pork, by 3.8% more than in 2007. Therefore, pork production has not raised too much in the analyzed interval. About 64% of the EU pork output is carried out in Germany, Spain, France, Denmark and Netherlands.
The EU pork exports were higher and higher, so that in 2018 they reached 3.93 million tonnes being almost double than in 2007. The pork imports are non significant for the EU and have a decreasing trend.
The EU export value accounted for Euro 7.3 billion, being more than double in 2008 compared to 2007. About 71 % of the EU export value is due to Spain, Germany, Denmark and Netherlands.
As pork imports declined from a quantitative point of view, the import value also decreased accounting for Euro 62 million in 2018, being by 22 % smaller than in 2007. About 66% of the import value is due to Germany, Denmark, France, United Kingdom, Italy and Spain.
The EU-28 is the top pork exporter in the world, its trade balance being a positive one and in 2018 reached Euro 7.2 Billion, being 2.3 times higher than in 2007. Spain,

Germany, Denmark, Netherlands, Italy, France have the highest trade balance.

The average price of pork carcass increased by 5% in the studied period, reaching Euro 142.04 in 2018 at the EU level.

Pork is the most consumed meat in the EU, accounting for kg/inhabitant at present, but it is expected to decline in favor of poultry meat for health and price reasons.

In 2018, the EU population consumed 20.6 million tonnes pork, representing about 19.6% of the global consumption. An EU inhabitant consumes about 35 kg pork in average per year, 3 times more than the world average, and this amount represent 47.3% of the annual meat consumption.

The analysis pointed out that the main trend in the near future for the EU pork market are the following ones: the decline of the pig livestock, a slight growth of pork production, exports will be intensified, imports will decline and also consumption will decrease.

REFERENCES

[1]Davis, C., 2019, 2017 Pig cost of production in selected countries, http://agricultura.gencat.cat/web/.content/de_departament/de02_estadistiques_observatoris/27_butlletins/02_butlletins_nd/documents_nd/fitxers_estatics_nd/2018/0219_2018_SProductius_Porci_Produccio-cost-2017-MON-INTERPIG-UK.pdf, Accessed on Jan.25, 2020.

[2]EU Commission, 2020, EU Agricultural Outlook for Markets and Income 2019-2030, https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/farming/documents/agricultural-outlook-2019-report_en.pdf, Accessed on Jan.25, 2020.

[3]EU CMO Committee, 2019, Pig Market Situation Europa, 12 Dec. 2019, Livestock, EU evolution of Total Pig, https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/farming/documents/pig-market-situation_en.pdf, Accessed on Jan.25, 2020.

[4]EU Commission, 2019, Meat Market Observatory-Pig, https://ec.europa.eu/info/food-farming-fisheries/farming/facts-and-figures/markets/overviews/market-observatories/meat_en, Accessed on Jan.25, 2020

[5]EU, 2020, Pig meat statistics, https://ec.europa.eu/info/food-farming-fisheries/farming/facts-and-figures/markets/overviews/market-observatories/meat/pigmeat-statistics_en, Accessed on Jan. 25, 2020.

[6]Eurostat, 2017, Pork production up in the EU, https://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20170919-1, Accssed on Jan. 25, 2020

[7]Eurostat, Easy COMEXT, 2020, http://epp.eurostat.ec.europa.eu/newxtweb/, Accessed on Jan.25, 2020.

[8]OECD -FAO, 2020, OECD-FAO Agricultural Outlook 2019-2028, Annex C, Meat and Pig Meat projections: Production and Trade, and Consumption, http://www.fao.org/3/ca4076en/ca4076en.pdf, Accessed on Jan.25, 2020.

[9]Pitts, N., Whitnall, T., 2019, Impact of African swine fever on global markets, https://www.agriculture.gov.au/abares/research-topics/agricultural-commodities/sep-2019/african-swine-fever, Accessed on Jan. 25, 2020

[10]Popescu, A., 2009, Evolution of World Pork Market, Scientific Papers Series D, Vol.LII, Animal Science (Lucrari stiintifice, Seria D, Vol LI, Zootehnie), p. 263-269.

[11]Popescu, A., 2009, Considerations concerning Romania's meat market, Scientific Papers Series D, Vol.LII, Animal Science (Lucrari stiintifice, Seria D, Vol LI, Zootehnie), p. 270-275.

[12]Popescu, A.,2010, Considerations concerning Romania’s Meat Market, 2010, Scientific Papers, Series D, vol. I, Animal Science: 270-275.

[13]Popescu, A., 2012, Study concerning the Trends in Pork Market in Romania, Scientific Papers- Series Animal Science (Lucrari stiintifice-Seria Zootehnie Iasi), Vol.57(17):99-103.

[14]Popescu, A., 2012, Study concerning the Economic Efficiency in Pig Fattening, Scientific Papers - Series Animal Science, (Lucrari stiintifice-Seria Zootehnie Iasi), Vol. 58(17):49-53.

[15]Popescu, A., 2012, Research concerning the Economic Efficiency in Pig Fattening in Farms of Various Sizes. Scientific Papers: Animal Science and Biotechnologies, 45(2), pp.397-403.

[16]Popescu, A., 2013, Research on Consumer Behaviour on Bucharest Meat Market, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.13(1):301-308.

[17]Popescu, A., 2015, Research on the Pork Production Trends in the EU-28, the CEECs and Romania, Proceedings of 25th IBIMA Conference Innovation Vision 2020: from Regional Development Sustainability to Global Economic Growth, Amsterdam, The Netherlands, May 7-8, 2015, pp.1407-1422

[18]Popescu, A., 2016, Research on concentration of pork production in Romania, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.16(1):405-410.

[19]Statista, 2020, Number of pigs worldwide from 2012 to 2019 (in million head) https://www.statista.com/statistics/263963/number-of-pigs-worldwide-since-1990/, Accessed on Jan. 25, 2020.

[20]Statistics 2017 Pig meat, Danish Agriculture & Food Council.

[21]Stępień, S, Polcyn, J., 2014, Pig meat market in selected EU countries under the conditions of economic

integration: A comparative analysis of old and new member states, Oeconomica, http://www.oeconomica.uab.ro/upload/lucrari/1820162/14.pdf, Accessed on Jan.25, 2020.
[22]Stępień, S, Polcyn, J., 2016, The phenomenon of cyclical fluctuations on the pork market - global perspective, Management, Vol. 20, No. 1, 382-396.
[23]Stupnišek, I., 2019, Analysis of the world and Croatian pork market, Agronomy Journal, Vol.81(1), https://hrcak.srce.hr/index.php?show=clanak&id_clanak_jezik=329094&lang=en, Accessed on Jan.25, 2020.
[24]Szücs, I., Vida, V., 2017, Global tendencies in pork meat-Production, Trade and Consumption, Applied Studies in Agribusiness and Commerce-APSTRACT, Vo.II.No.3-4, 105-112.
[25]USDA, 2019, Livestock and Poultry: World Markets and Trade, https://apps.fas.usda.gov/psdonline/circulars/livestock_poultry.pdf, Accessed on Jan.4, 2020.