

PORK CRISIS IN ROMANIA IN THE CONDITIONS OF AFRICAN SWINE FEVER IN THE PERIOD 2017-2019

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Abstract

The paper aimed to analyze the status of pork market during the period 2017-2019 under the impact of African Swine Fever (ASF) in order to assess the consequences on pig livestock, pork production, trade, and price compared to the period 2014-2016. Using the data provided by Faostat and National Institute of Statistics, and the usual methods specific to such an analysis: fixed index, trend line, regression equations and determination coefficient, the obtained results have pointed out that in the interval 2017-2019 versus 2014-2016, of pig livestock, ASF has amplified the decline of pig livestock, slaughtered pigs and their live weight, and pork production. The higher demand than offer on the domestic market increased imports to assure food security and increased pork price. Farmers are discouraged to grow pigs due to the lack of biological material, high price for piglets and feedstuff, high production cost and the high risk that their business to fail, as long as subsidies and aids are missing in pig farming. In consequence, it is needed a new strategy which has to be adapted to the actual situation at the European level destined to counteract the spread of ASF by using efficient measures of traceability and biosecurity along the pork chain. Veterinary authorities have to join their forces to eradicate this disease and produce a vaccine for saving pig livestock. Subsidies and aids are required to sustain pig growing in Romania, where pork is a strategic food.

Key words: pork crisis, livestock, production, trade, price, African Swine Fever, Romania

INTRODUCTION

Pork continue to be a preferred meat at the global level as it is an important source of animal protein. The demand is expected to grow stimulating the increase of pork price and international trade [21, 31].

However, the outbreak of African Swine Fever (ASF) has produced disruptions in pig livestock, pork production in many countries and continue to have a deep negative impact in the international pork market.

Starting in the Asian countries, mainly in China, ASF was spread in Europe were produced important damages in pork sector of almost all the countries. Romania, Poland, Hungary, the Nordic countries, Belgium, Slovakia, Slovenia, Italy have suffered in various ways and proportions due to ASF [4, 18].

In 2019, ASF has expended progressively to the South West of the EU. But, the actual

situation varies from a country to another depending of many factors such as: pig farm structure and mainly the share of backyard holdings, geographical conditions and the status of wild boar population [5].

In Romania, ASF arrived in 2017, the virus being brought by the wild boars coming from Ukraine and invaded the South Eastern and South Muntenia regions which have been seriously affected compared to other regions like West, Center, and North East [9, 16, 29].

The disease was spread rapidly in Romania due to the existence of a high number of wild boars attracted by the cultivated crops, the huge number of backyard pig farms situated close to each other, indirect transmission by people having contact with the infected animals and farms, contaminated vehicles, etc [2].

In Romania there are 1,220 ASF outbreaks in 28 counties. About 13 outbreaks have appeared in commercial companies. Over

600,000 pigs are already killed from the beginning of the epidemic. And the effect of these aspects was noticed along the whole production chain [20].

For Romania, ASF was an additional risk factor for pork market in a critical moment when it was in decline, despite that the country is among the most important pig growing member states of the EU coming on the 10th position for its swine livestock [27, 30].

Romania is a special case in the EU taking into account the high number of pig farms, dominated by small sized holdings raising 1-10 pigs and the low percentage of the commercial industrialized companies, and also growing a high number of pigs [10, 12, 17].

The sector is passing through a real crisis caused by the high farm input price especially for piglets and feedstuff, lack of biological material, high production cost, low profitability, lack of subsidies. In consequence, a few farmers failed and other are in danger of bankruptcy and this led to the decline of pig livestock and pork production, the internal output could not cover the domestic market requirements and pork imports increased, affecting local producers [23, 24, 25]. However, pork is and continues to be a traditional meat consumed in Romania, a reason to be considered "a strategic food" which have to determine the public authorities to offer a financial support to pig breeders [22, 26].

In this context, the paper aimed to analyze pork market during the period 2017-2019 under the impact of ASF in order to evaluate the consequences on pig livestock, pork production, trade, and price compared to the period 2014-2016.

MATERIALS AND METHODS

This study is based on FAOSTAT and National Institute of Statistics data for the period 2014-2019.

The main indicators studied within this research are the following ones:

- pig livestock, number of pigs slaughtered for consumption, total live weight at slaughter,

- average live weight at slaughter, pork production, average acquisition price per kg live weight at farm gate, pork carcass price;

- pork export and import quantity, the value of pork export, import and trade balance, and export FOB price and import CIS price.

The methodology applied to process data includes usual modern techniques and procedures such as: fixed basis index, trend equations and coefficient of determination.

The results obtained from this study were illustrated in graphics and tables, and the corresponding comments were added. Finally, the main conclusions resulting from this research were drawn.

RESULTS AND DISCUSSIONS

Pig livestock

Romania is a country raising a high number of pigs, coming on the 10th position after Germany, Spain, France, Poland, Denmark, Netherlands, Belgium, Austria, and Hungary.

The evolution of pig livestock in Romania is a decreasing one, similar to the general trend in the EU, except a few countries where the pig number increased [27].

In the period 2014-2019, pig livestock declined in Romania by 76% from 5,041,788 heads in 2014 to 3,834,136 heads in 2019 (Fig.1).

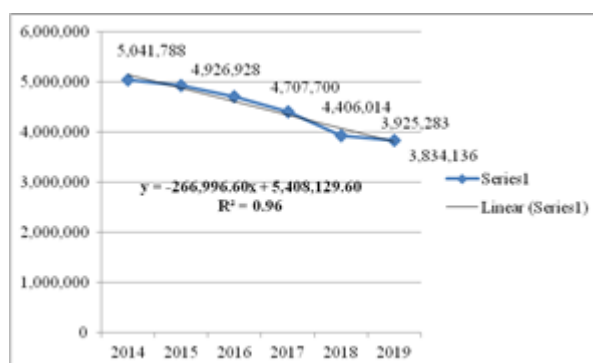


Fig. 1. Pig livestock in the period 2014-2019, Romania (heads)

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

This decrease was caused by the following factors among which the most important ones are: the lack of piglets in the country in close relationship with the reduction of the number of sows, the high price for purchasing piglets

from other countries which has a deep impact on production cost, in which the share of the biological material is over 50%. Also, the lack of subsidies for swine sector discourages farmers to continue their business in pig fattening, the low price at farm gate per kg of pig live weight, being not enough to cover piglets and feedstuff and other costs [33].

The high share of over 60% of the small farms growing 1-10 pigs does not allow the increase of productivity and efficiency in pig farming and the number of farms growing over 400 pigs represents a small proportion, just 33% [10, 11, 13].

Despite that Romania keeps more than 50% of the number of pig farms of the EU, only the commercial holdings are able to increase performance and reach profitability.

However, the numerous small farms should be not ignored, as they cover the family and relatives needs.

Pigs are raised in the whole Romania, and the decreasing order of the micro-regions based on the number of pigs is: West (22.7%), South Muntenia (15.4%), North West (14.9%), South West Oltenia (13.2%), North East (11.7%), South East (11.6%), Centre (9.7%) and Bucharest-Ilfov (0.8%) [1].

The outbreak of ASF in 2017 changed the dispersion of the number of pigs in the territory as shown in Table 1, from which it is easy to identify that the most affected regions were South East and South Muntenia, whose share in the total number of pigs decreased from 14.4% in 2016 to 11.6% and, respectively, from 16.25 to 15.4% in 2019.

In this year, Romania lost 848,408 pigs compared to the year 2016, when it had 4,574,690 heads, before the outbreak of ASF. Of course, the decline in pig number was intensified by ASF besides the actions of the other restraining factors as mentioned above.

Table 1. Changes in the distribution of pig livestock in the territory in 2018 versus 2016, the year before the ASF outbreak in Romania (heads)

	2016 (heads)	2019 (heads)	2019-2016 (heads)	2019/2016 (%)	Share of the region (%)	
					in 2016	in 2019
N East	489,985	436,573	-53,412	89.0	10.7	11.7
S East	657,258	434,503	-222,755	66.0	14.4	11.6
S Muntenia	743,468	574,530	-168,938	77.0	16.2	15.4
S W Oltenia	569,940	494,051	-75,889	86.6	12.4	13.2
West	959,956	846,880	-113,076	88.2	20.9	22.7
N West	669,586	558,025	-111,561	83.3	14.6	14.9
Centre	465,904	362,751	-103,153	77.8	10.1	9.7
Bucharest-Ilfov	18,593	18,969	+378	102.0	0.7	0.8
Total	4,574,690	3,726,282	-848,408	81.4	100.0	100.0

Source: Own calculation based on the data from [15].

If we take into account that in the period 2014-2016 Romania raised in average 4,892,139 pigs per year and in the period of ASF, it had only 4,055,144 pigs per year, this means a difference of 836,995 pigs that is by 17.115 less (Table 2).

Number of slaughtered pigs for consumption

The decline in pig livestock has led to the decrease of the number of slaughtered pigs. In the last three years when ASF has operated, Romania slaughtered 15,032,240 pigs for consumption, by 2,379,760 less than in the period 2014-2016, meaning - 13.67% (Table 2).

Table 2. Pig livestock and the number of pigs slaughtered for consumption (heads)

	Average pig livestock (heads/year)	Number of slaughtered pigs for consumption (heads)
(a) 2014-2016	4,892,139	17,412,000
(b) 2017-2019	4,055,144	15,032,240
(b)- (a)	-836,995	-2,379,760
(b)/(a)*100 (%)	82.89	86.33

Source: Own calculation based on the data from [7, 15].

The decline in the number of slaughtered pigs was registered not only in Romania, but also

in Greece, Germany, Poland, Denmark. However, in other countries like Lithuania, Slovakia, Bulgaria, Estonia, Slovenia were it was slaughtered a higher number of pigs. But, at the EU level, the slaughtered pigs were by 1.3% less numerous than before [8].

The live weight of slaughtered pigs has also declined in Romania in the last six years. In the period 2017-2019, it accounted for 1,645,444 tonnes live weight, being by 39,642 tonnes smaller than in the period 2014-2016 (Table 3).

Table 3. Live weight of slaughtered pigs and pork production

	Total live weight of slaughtered pigs (tonnes)	Average pig live weight at slaughter (kg/head)	Pig meat production (tonnes)
(a) 2014-2016	1,685,086	96.7	1,430,588
(b) 2017-2019	1,645,444	110.3	1,317,626
(b)- (a)	-39,642	+13.6	-112,962
(b)/(a)*100 (%)	97.64%	114.06	92.10

Source: Own calculation based on the data from [7, 15].

The average pig live weight at slaughter was influenced not only by the number of slaughtered pigs and their live weight, but also by the average live weight at slaughter, which is an important indicator reflecting pig fattening efficiency and meat quality. It depends on the technology applied in pig fattening, breeds and hybrids used, feeding, daily gain and other technological factors [24, 25, 32].

If in the period 2014-2016, the average live weight at slaughter was 96.7 kg/head, in the next three years, 2017-2019, it reached 110.3 kg, which is a positive aspect, meaning by +14.06% more, the level of about 110 kg assuring a high carcass quality related to the thickness of fat layer (Table 3).

Pork production followed a decline caused by the decrease of the number of pigs, slaughtered pigs and total live weight at slaughter.

In 2019, Romania produced 398,730 tonnes pork by 13.3 % less than in 2014, when it carried out 459,756 tonnes (Fig.2).

Taking into account pig meat production in the period 2017-2019 under the ASF, the loss of production accounted for 112,962 tonnes compared to the performance achieved in the period 2014-2016 (Table 3) [28].

Pork consumption

Pork is the most consumed meat sort by Romanians, the average annual consumption accounting for 38.5 kg/inhabitant in 2019, representing 50% of the total meat consumption of 77 kg/year/capita. On the second position comes poultry meat, a Romanian consuming 27 kg per year [14].

Despite that pork consumption in Romania was a little smaller in Romania compared to the EU average, in 2019 it exceeded the EU average. However, it is still lower compared to the average consumption in Spain, Poland, Austria, Germany, Czech Republic, Portugal, Italy and Netherlands, therefore, from this point of view, Romania comes on the 9th position [12].

Pork trade

Pork import and export amounts

Due to the decline in pig live stock, and also due to the ASF which imposed as more than 560,000 pigs to be killed, with a negative impact on the production chain, the losses registered by farmers who have been discouraged to deal with pig farming, the high risk of the extend of the ASF with a high pressure not only in Romania, but also in all

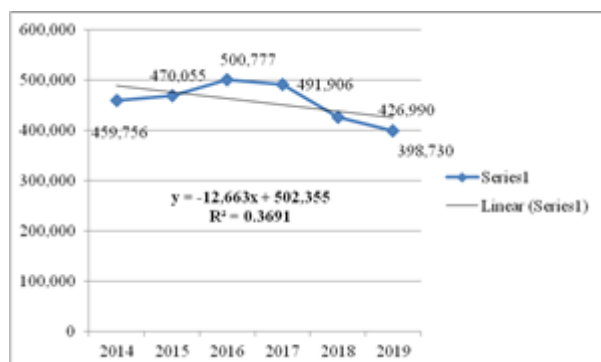


Fig. 2. Pork production, Romania, 2014-2019 (Tonnes)
 Source: Own design based on the data from [7].

the Eastern European countries, Romania was obliged to cover the domestic market requirements and assure food security of the population and for this reasons it has become more and more dependent on import [20]. In 2019, Romania imported 122,009 tonnes pork, by 37.19% more than in 2014. At the

same time, the amount of exported pork varied from a year to another during the last six years, but in 2019, it registered the lowest level, accounting for only 5,687 tonnes, being by 43% lower than in 2014 (Fig. 3).

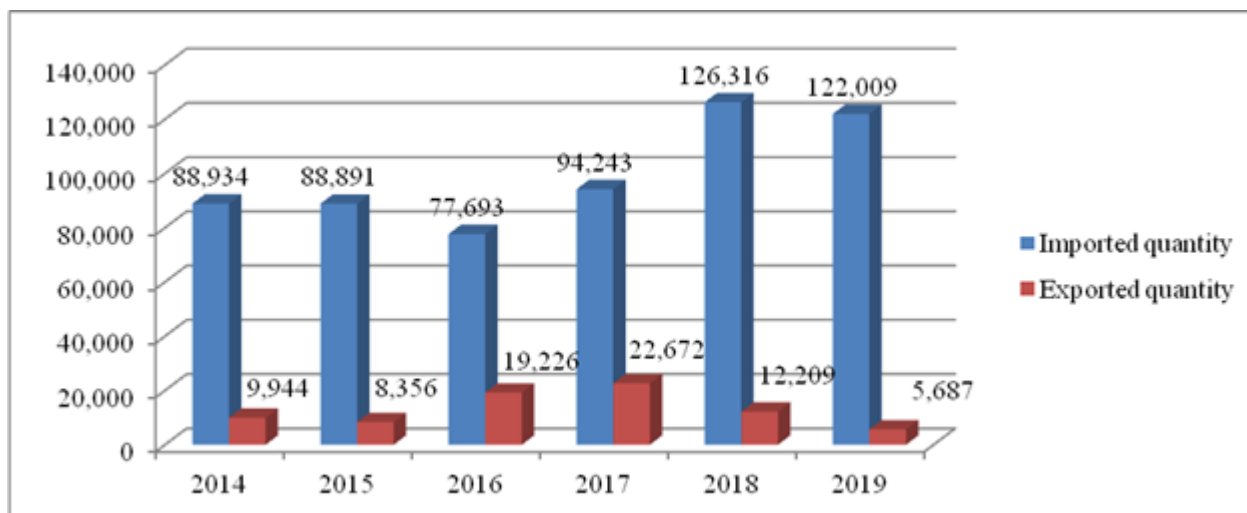


Fig.3. The amount of imported and exported pork (Tons)
 Source: Own design based on the data from [7].

The figures show huge discrepancies between the pork export and import amount every year. Taking into consideration the period 2017-2019, when ASF had an additional influence on the quantitative trade with pork, we may notice that in this interval Romania

imported 342,568 tonnes pork, by 87,000 tonnes, that is by +34% more than in the period 2014-2016.

In the interval 2017-2019, Romania exported 40,568 tonnes pork, by 8.15% more than in the period 2014-2016 (Table 4).

Table 4. Imported and exported pig meat (tonnes)

	Imported pig meat (Tonnes)	Exported pig meat (Tonnes)	Import/Export ratio
(a) 2014-2016	255,518	37,526	6.8/1
(b) 2017-2019	342,568	40,568	8.4/1
(b)- (a)	+87,050	+3,042	+1.6
(b)/(a)*100 (%)	134.00	109.10	123.5

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

The value of pig meat import and export has also showed huge differences year by year resulting a higher and higher negative trade balance (Fig. 4). While pork import value increased from USD 203.1 Million in 2014 to USD 291.8 Million in 2019, meaning by 43.67% higher, the pork export value declined from USD 23.4 Million in 2014 to USD 6.3 Million in 2019, being by 73.1% smaller than in the first year of the analyzed period.

As a consequence, the negative balance increased by 59.4% from USD -179.1 Million in 2014 to USD 285.5 Million in 2019.

Taking into account the influence of ASF, we may notice that in the period 2017-2019 compared to the interval 2014-2016, pork import value increased by 46.9%, while export value decreased by 13% (Table 5).

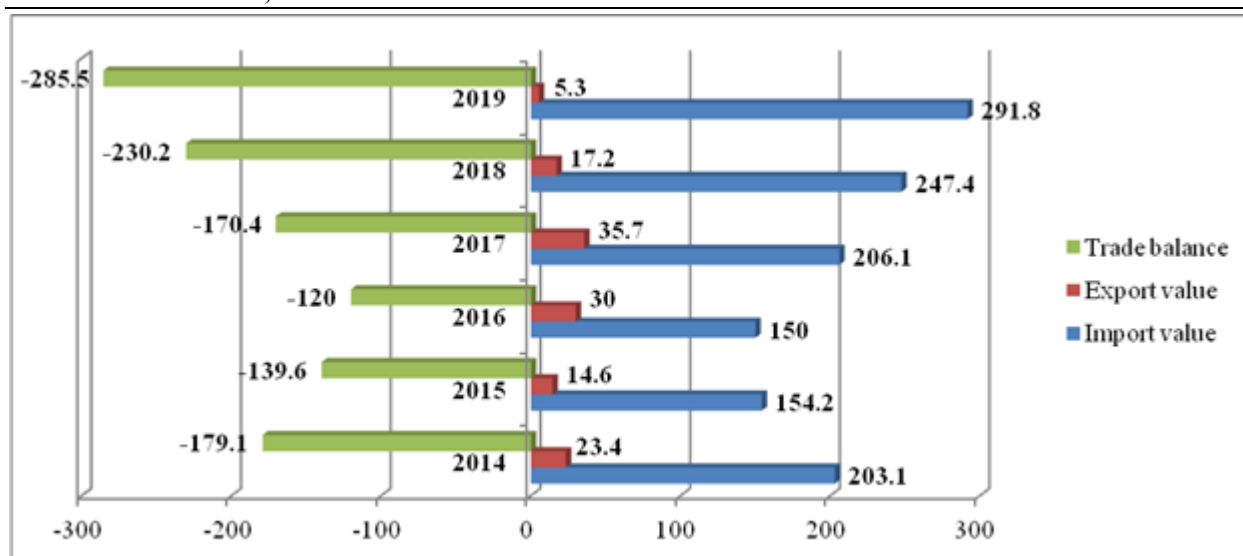


Fig. 4. The value of pork export, import and trade balance, Romania, 2014-2019 (USD Million)
 Source: Own design based on the data from [7].

Table 5. Pig meat export value, import value and trade balance (USD Million)

	Import value	Export value	Trade balance
(a) 2014-2016	507.3	68	-439.3
(b) 2017-2019	745.3	59.2	-686.1
(b)- (a)	+238	-8.8	+229.2
(b)/(a)*100 (%)	146.9	87.00	156.18

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

Pork price

The average acquisition price at farm gate per kg live weight varied between Lei 5.81 in 2014 and Lei 6.2 in 2019, when it was by only 6.7% higher than in the first year of the studied period.

But, we have to mention that in the month of December, when it was a high demand for pork, as the traditional meals for Christmas in Romania are prepared of pork, the price per kg live weight raised and reached Lei 8 per kg at the end of the month (Fig. 5).

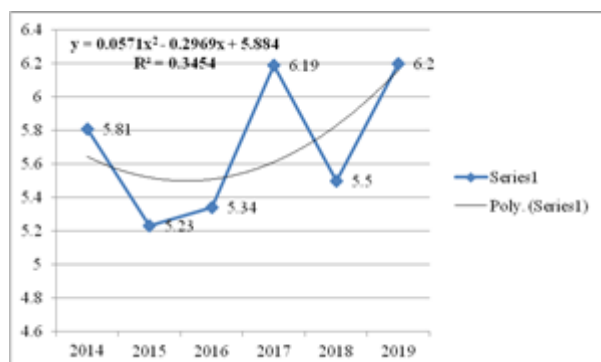


Fig. 5. Average acquisition price per kg live weight at farm gate (Lei/kg)

Source: Own design based on the data from [15].

Also, the variation of average monthly acquisition price in 2019 is exposed in Fig.6, from which we may easily notice that the price has continuously increased since the month of January to the month of December.

In 2019, due to the pork crisis in the international market caused by the high demand of pork on the Asian market, where ASF killed million of pigs, pork carcass price registered a high increase which started from the month of April.

The EU which was one of the main suppliers of pork in the Asian market, especially on Chinese market which is the largest importer, benefited of this advantage intensifying its export and pork carcass price increased.

Due to pork crisis in the international market it is expected as pork price to reach the highest level during the last 15 years [3].

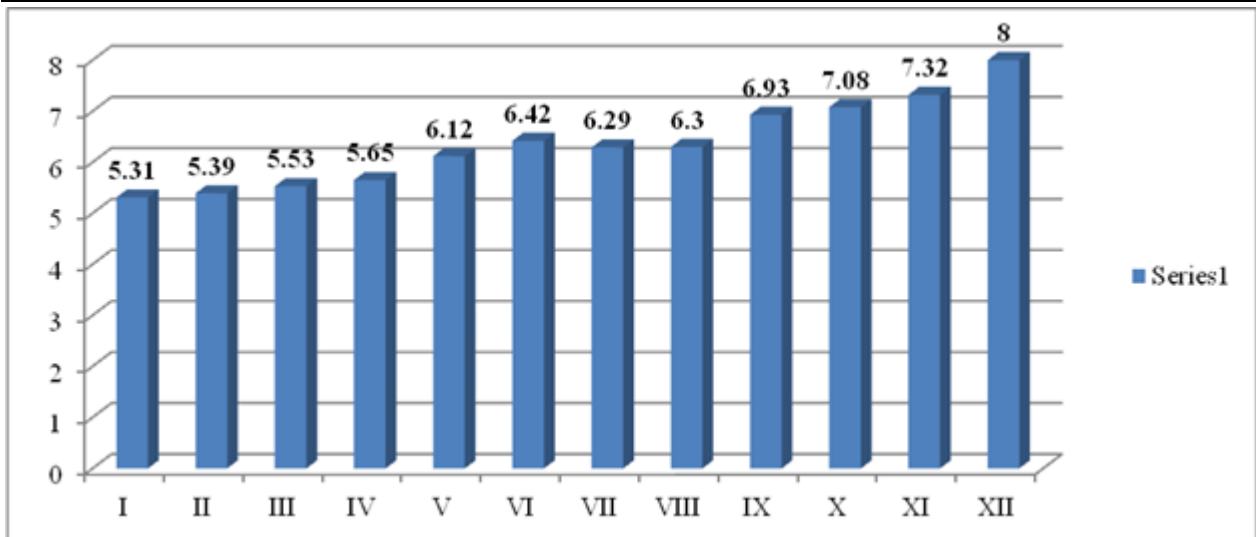


Fig. 6. The monthly dynamics of average acquisition price per kg live weight in 2019 (Lei/kg)
 Source: Own design based on the data from [15].

Pork carcass price

The same tendency was noticed in Romania, where the average pork E class carcass price had a general ascending trend, starting from the 3rd week of the year 2019, when it registered the lowest level of Euro 105.09 per 100 kg, and then, it has continuously grown reaching the maximum level of Euro 223.28 per 100 kg in the 52nd week of the year.

In the weeks 1-16, Romania had a lower price than the EU average price, but, then, the price of pork carcass increased in a faster way than in the EU average, but starting from the week 17 and ended the year 2019 at the level Euro 223.28 per 100 kg compared to the EU average price of Euro 193.68 (Fig. 7).

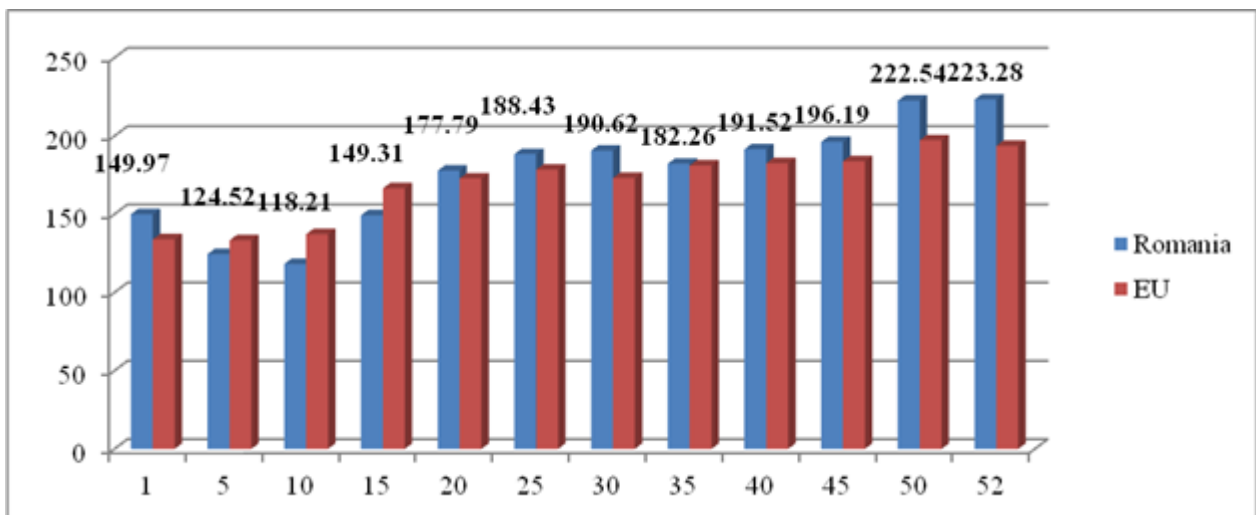


Fig. 7. Comparison concerning the dynamics of average pork Class E carcass Price in Romania and the EU in 2019 (Euro/100 kg)
 Source: Own design based on the data from [6].

The higher carcass price is justified by the higher demand, the lack of sufficient offer, the high price for farm inputs especially for piglets and feedstuff. In 2019, average class S- E carcass price increased by 43.6% and the piglets price by 65% [8].

The increase of pork price at the international level has a deep impact on import price, as Romania has to assure food security of the population by imports, and this will led to the growth of pork price in supermarkets [3].

In the period 2014-2019, Romania's average pork export and import price showed important differences. In 2014 and 2015, export price was higher than import price, while in the period 2016-2019, during the interval when ASF operated, import price became higher than export price.

While export price declined by 52.53% from USD 2,357 per tonne in 2014 to USD 1,119 per tonne in 2019, import price increased by 4.72% from USD 2,284 to USD 2,392 (Table 5).

Table 5. Romania's average pork export and import price, 2014-2019 (USD per tonne)

	Average pork export price	Average pork import price	Differences (Export price - Import price)
2014	2,357	2,284	+73
2015	1,747	1,735	+12
2016	1,563	1,931	- 368
2017	1,575	2,187	-612
2018	1,412	1,959	-547
2019	1,119	2,392	-273
2019/2014 (%)	43.47	104.72	-

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

Not to forget that raw material accounts for over 50% in the final price of the products obtained in meat industry. The lack of raw material in the internal market obliged the processors to buy pork, pork carcasses and even live animals to continue their activity, and this with the risk of paying a higher import price. The main suppliers of fresh, refrigerated and frozen pork are Germany, Spain, Belgium, Hungary and Denmark. The high import price has resulted in higher prices for pork and pork preparations at consumer level [20].

The imports of pork have continued in the year 2020, as long as internal production is still able to cover only 30% of the consumption needs. Most of the imported pork comes from intra-EU trade and continue to grow the deficit of pork trade balance [19, 34].

CONCLUSIONS

The study proved that in the period 2016-2019, the outbreak of AFS has intensified the pork crisis in Romania characterized by the decline in pig livestock, pig number delivered to slaughterhouses, pork production, lack of raw material, increased production cost, and pork price.

The main causes are related to the invasion of the wild boars, the high number of small

farms situated close to each other, the regulations regarding the compliance of the bioprotection measures which have not been entirely respected, the traffic of people, vehicles and products in the areas with outbreaks, the lack of consciousness from people's part how severe is this disease, the lack of treatments and of a vaccine against ASF.

As a result, the demand/offer ratio was not balance, and about 70% of the internal market needs had to be covered by imports at a high price.

Farmers are in a critical situation, with a lower livestock of pigs, lacked of raw biological materials (piglets, soybean cake and other feedstuff etc), obliged to pay more money for farms inputs, to raise production costs, and get a low price per kg live weight at the farm gate. Industry is also in crisis being obliged to buy raw material from abroad at a high price with a deep impact of the final price at consumer level.

However, pork consumption remains at a high level as pork is the traditional meat in Romania.

The analysis allowed to mention a few solutions to stop the extend of ASF and diminish pork crisis which are presented below:

- to respect the provisions of the combat program against ASF supported by the EU in a proportion of 75%;
- the veterinary authorities to permanently check the persons, vehicles, animal and meat traffic in the active outbreaks of swine fever;
- conducting epidemiological investigations on non-commercial farms, which represent 90% of the ASF outbreaks, in order to identify the infected live animals and contaminated products and take the corresponding measures to eliminate them for not spreading the disease;
- efficient measures of traceability and biosecurity for transported live pigs and pork products have to be taken;
- the increase of the consciousness degree regarding the best practices of biosecurity which could be applied by pork breeders, slaughterhouses, merchants and transporters in order to counteract the spread of ASF;
- the disease eradication must be seen as an European problem as 75% of the pigs are raised in the population households; in this context, the legislation in force has to be improve and better adapted to the actual situation which imposes severe measures for the combat of outbreaks and disease eradication, and the legal provisions have to be entirely respected by all the member states;
- efforts have to continue to be made for producing a vaccine against ASF as soon as possible to stop the spread of this disease;
- Ministry of Agriculture has to develop a new strategy to sustain the development of internal pork production by offering support to pig breeders for making investments in pig farming, assuring the reproduction animals, piglets, soybean cake from internal production by increasing the cultivated surface with soy bean, because the import price of soybean cake is very high, allotting a financial aid for reproduction and each pig delivered to the slaughterhouse, the supermarkets to buy pork especially from the Romanian producers.

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