

ASPECTS REGARDING THE EVOLUTION OF AFRICAN SWINE FEVER IN ROMANIA

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The global spread of African swine fever (ASF) is a threat to the livestock sector with potentially serious consequences for food security. The article proposes an analysis of ASF in Romania from the perspective of the evolution of the number of outbreaks and their impact on the number of pigs, the production obtained and the delivery price. The analysis is based on data provided by the National Institute of Statistics and the National Sanitary Veterinary and Food Safety Authority. The data indicate that in order to prevent the spread of ASF, 1,208,229 swine heads affected by the disease were eliminated (of which approximately 60,000 breeding sows), the total compensation to the affected owners being 890,880 thousand lei. The impact of the ASF on the pig farming sector translates into a decrease in total herds by 22.6%, a decrease in total meat production by 15.3% and an increase by 16.5% in the average purchase price per kg live weight.

Keywords: African swine fever, outbreaks, herds, production, delivery price

1. INTRODUCTION

African swine fever is a highly contagious viral disease that affects populations of domestic and feral pigs. In subacute clinical forms of ASF mortality is between 0-60% while in acute and superacute forms mortality can reach 100% (Sánchez-Vizcaíno J.M. et al. [8]).

The first case of ASF was diagnosed in Kenya in 1909 and reported as a disease distinct from classical swine fever by Montgomery in 1921 (Montgomery E.R. [5]). Since 2007, the disease has been reported in several countries in Africa, Asia and Europe, both domestic and feral pigs (Oura C.A.L. et al. [4]).

In 2012, almost half of Africa's pig-producing countries reported outbreaks of ASF, and in August 2018, new outbreaks of ASF appeared in China, Mongolia, Vietnam, Korea, Cambodia, Laos, and Indonesia (Carrillo, Consuelo. [6]).

Globally, about 43% of the total pig population is kept in extensive production systems, where biosecurity practices are low and where once introduced, the ASF virus spreads through human activities and quickly becomes endemic to domestic pigs (Costard S et al. [1]). The spread of ASF virus genotype II in the feral pig population was unprecedented. Factors that contributed to the spread of ASF in feral pig populations were climate change and increased grain production that increased the local density of feral pigs and expanded their geographical distribution (FAO, [3]).

The disease is currently endemic in wild boar populations in several countries and continues to expand in Europe, causing very serious concern. Control of the ASF epidemic is a very difficult task for veterinary authorities, given the complexity of the epidemiology of the disease, the lack of previous experience, the unique geographical scope of the problem, its cross-border and multisectoral nature (Mary-Louise Penrith. et al. [7]).

If we analyse the impact of ASF by region, according to the World Organization for Animal Health [9] in the period 2016-2020 Asia reported the majority of ASF outbreaks (9,928 outbreaks, respectively 69.3% of total outbreaks) having the greatest impact in terms of animal losses (6,733,791 animals lost, representing 82.1% of the total losses reported during this period).

From January 2020 to 04.03.2022, through the early warning system, ASF was reported as present in 35 countries in five different regions of the world (Table 1). During this period, approximately 5,000 outbreaks of ASF were recorded in domestic pigs where more than 1,100,000 pig heads were affected and approximately 31,000 confirmed cases in wild boars. The loss of pigs was over 1,700,000 (OIE. [10]).

Regarding the impact of ASF by region, we note that Europe reported the most outbreaks (3,438 outbreaks of ASF, respectively 69.4% of total outbreaks), with the highest impact in terms of reported animal losses (1,337,472 of lost animals, which represents 75.23% of the total losses reported during this period).

Table 1: Impact on regions of African swine fever (2020-04.03.2022)

	Outbreaks		Cases		Losses*
	domestic pigs	wild boar	domestic pigs	wild boar	domestic pigs
Africa	158		13,031		20,377
Americas	250		9,530		17,729
Asia	1,103	1,520	91,240	1,710	401,933
Europe	3,438	17,166	993,449	29,267	1,337,472
Oceania	4		500		397
Total	4,953	18,686	1,107,750	30,977	1,777,908

Source: World Animal Health Information Department [10]

*Losses (deaths + animals killed and disposed of)

Two separate periods of incidence of ASF virus have been reported in Europe. The first period of spread in Europe (1960-1995) was through Spain and Portugal to other Western European countries and eventually led to the eradication of ASF. The second period (2007-ongoing) was through Georgia to Eastern European countries (Cwynar, P et al. [2]).

Many European countries have reported the first outbreak of the disease since 2016. Regarding the situation of outbreaks of ASF registered in Europe, in the period 2019-2021 (Table 2) we note that in 2019 most outbreaks of ASF in domestic pigs, respectively 1,908 outbreaks. By 2020, Europe has made significant progress in combating ASF in domestic pigs. Thus, according to the European Commission's notification system, 1,240 outbreaks of ASF were confirmed in 2020, 668 fewer outbreaks than in 2019. In contrast, the number of European states that confirmed cases of ASF in domestic pigs increased from nine countries, in 2019 to 10 in 2020. As in 2019, Romania registered the vast majority of ASF outbreaks in Europe, 1,053 (85% of the total), almost all in semi-subsistence farms. Regarding the cases of ASF in wild boars, in 2020, in Europe, there were significantly more cases of ASF compared to 2019, respectively, 14 European countries registered a total of 11,027 outbreaks of ASF among the population's boars, with 72% more cases than in 2019, when there were 6,407 outbreaks in 11 countries in the region.

Table 2: PPA situation in the European Union in the period 2019-2021

	Outbreaks 2019		Outbreaks 2020		Outbreaks 2021	
	domestic pigs	wild boar	domestic pigs	wild boar	domestic pigs	wild boar
Poland	48	2,468	103	4,070	107	2,278
Lithuania	19	464	3	230	-	117
Latvia	1	369	3	320	2	216
Estonia	-	80	-	68	5	47
Romania	1,724	683	1,053	885	1,354	877
Hungary	-	1,598	-	4,001	-	2,512
Bulgaria	44	165	19	533	5	198
Belgium	-	482	-	3	-	-
Italy	1	60	-	41	-	5
Slovakia	11	27	17	375	8	1,453
Greece	-	-	1	-	-	-
Germany	-	-	-	403	3	1,689
Moldavia	-	-	2	30	1	-
Serbia	18	-	16	63	33	71
Ukraine	42	11	23	5	9	2
TOTAL	1,908	6,407	1,240	11,027	1,523	9,465

Source: European Commission - Animal Disease Notification System

2. MATERIALS AND METHODS

The study aims to analyse the evolution of ASF in Romania from the perspective of the impact it had on the pig breeding sector. For this purpose, the study of the scientific literature and the processing of official data on the effects of ASF on pig holdings were used. For the analysis, data from the National Institute of Statistics (NIS), the National Sanitary Veterinary and Food Safety Authority (NSVFSa) were used.

The analysis of the PPA evolution took into account the number of outbreaks, the number of counties and localities affected, the number of pigs eliminated and the total amount of compensation. In order to highlight the effects of ASF on the pig farming sector, the indicators studied were: total number of animals, pork production and average delivery price. The data regarding the value of the indicators were processed by statistical mathematical methods, presented in the paper in the form of tables and graphs and discussed in detail during the paper.

The study concludes with the conclusions that highlight the main aspects regarding the analysis of the pig breeding sector in Romania from the perspective of the effects of African swine fever.

3. RESULTS AND DISCUSSIONS

At the time of the appearance of the ASF in Romania, the structure of the pig farming sector was as follows:

industrial commercial holdings - 311 holdings with a total herd of 1,734,191 pigs;

commercial holdings of type A - 158 holdings with a total herd of 8,255 pigs;

non-commercial holdings (in households) - 809,096 holdings with a herd of 2,765,912 pigs.

Regarding the herds of wild pigs (wild boars), in Romania there are 2,154 hunting funds and the total number of wild boars is estimated at 63,916 animals, which live on an area of approximately 65,000 km² (the surface of Romania is 238,391 km²). The density of wild boars is relatively low (<1 animal / km²) compared to the density in the areas of Western Europe (>2 animals / km²).

In Romania, ASF was detected in domestic pigs in July 2017, in two farms in Satu Mare County and the first case of confirmed ASF in wild boars was reported in the same area in May 2018. The next outbreak of ASF appeared in the other part of the country, in Tulcea County, close to the border with Ukraine, at the beginning of June 2018. Further ASF expanded in the north-western and south-eastern regions of Romania with the emergence of new outbreaks, so that in 2018, ASF was present in 301 localities from 19 counties of the country. The evolution of ASF continued in the following years with the appearance of new outbreaks in domestic pigs and the confirmation of new cases of ASF in wild pigs. From the NSVFSa data regarding the evolution of ASF in Romania, presented in table 3, we note that from the first report of the presence of ASF virus in Romania until the end of

2021, there were 5,617 confirmed outbreaks in domestic pigs and 6,161 confirmed cases in wild boars. Throughout this period, the ASF has created problems in a number of 41 counties of the country, affecting both individual holdings and commercial or industrial holdings.

During this period, out of the total number of existing active outbreaks, a number of 5,486 outbreaks were extinguished and 1,208,229 swine heads affected by the disease were eliminated (of which approximately 60,000 breeding sows), the total compensation to the affected owners being 890,880 thousand lei. It should be mentioned that ASF created special problems because there were areas in certain counties of the country (eg Teleorman, Gorj, Iasi and Salaj counties) where some outbreaks confirmed in the previous year could not be extinguished due to the appearance of new successive outbreaks in these areas. On the other hand, there were other areas (in the counties of Dolj, Bacau, Satu Mare and Buzau) in which, even if the outbreaks confirmed in that year were extinguished, new successive outbreaks appeared. According to NSVFSA data, on 06.01.2022 in Romania were active 135 outbreaks of PPA, of which 16 outbreaks in commercial pig farms (including commercial type A farms), being affected a number of 276,348 pig heads from active outbreaks. Regarding the ASF cases diagnosed in wild boars, NSVFSA data show that in the period 2017-2021, a number of 6,161 cases in wild boars were diagnosed in 41 counties of the country. New cases diagnosed in wild boars continue to appear. Thus, in the period 01.01. - 06.01.2022, 11 new cases of ASF were registered in wild boars in 6 counties. According to European provisions, cases of ASF in wild boars are extinguished at least 2 years after their appearance.

Table 3: The evolution of PPA in Romania during 2017-2021

	2017	2018	2019	2020	2021
Affected counties	1	19	24	29	41
Total localities affected	1	301	237	155	287
Nr. confirmed outbreaks of which:	2	1,164	1,728	1,063	1,660
in households	2	1125	1.745	1.035	1.245
in commercial holdings		19	12	24	36
in type A holding		1	2	8	9
Nr. pigs removed		364,212	179,409	194,211	470,397
Nr. outbreaks extinguished	2	617	2,257	1,063	1,529
Nr. cases in wild boars		558	1,889	1,734	1,980
Total amount of compensation (thousand lei)		251,121	152,149	204,110	283,500

Source: own calculations based on NSVFSA data

In most cases, successive outbreaks or confirmed new outbreaks have occurred mainly due to: non-compliance with the ASF Wildlife Eradication Plan; non-compliance with restrictions imposed in protection and / or surveillance zones (minimum 10 km around the outbreak) and biosecurity measures on non-commercial holdings, in particular as regards the movement of animals; illegal transport of animals from restricted areas to free zones, without complying with legal provisions. The evolution of PPA in Romania has demonstrated a number of characteristics, namely: a slow transmission of the virus in the affected farms; long-distance transmission with high incidence in low biosecurity holdings; infection of wild boar populations and contamination of the environment.

The fact that outbreaks of ASF occur primarily, but not exclusively, in low-biosecurity farms, shows that there is a need for awareness among farmers of the importance of implementing preventive measures to transmit the disease. The structure of the pig farming sector, both the industrial system and especially the traditional one, is a determining factor of the ASF epidemiology.

Regarding the evolution of the total number of pigs, from the data published by NIS, we notice that in the period 2016-2021 the total number of herds decreased by 22.6%, from 4,574.7 thousand heads in 2016 to 3541.5 thousand heads in 2021 (table no. 4). During this period, the total number of breeding sows decreased by 32.4%, from 339.0 thousand heads in 2016 to 229.2 thousand heads in 2021. The reduction of pig herds due to the manifestation of the ASF epidemic had a major impact on the repopulation of farms with native genetic material.

Table no. 4: The evolution of pig herds in Romania (thousands of heads)

	2016	2017	2018	2019	2020	2021
Total pigs	4574.7	4486.6	4129.3	3726.3	3669.3	3541.5
Total breeding sows	339.0	326.3	280.0	251.0	236.8	229.2

Source www.insse.ro/time-online

From the perspective of meat production, there were important changes in the structure of the pig farming sector, in the sense that the number of animals slaughtered in specialized industrial units (slaughterhouses) increased, individual households losing the position of the largest pig farmer in favor of specialized farms.

The importance of households in the pork sector has also diminished due to the high purchase price of pigs delivered from households. The emergence and spread of ASF outbreaks has had a negative impact on the pig farming sector due to the imposition of restrictions on the movement of animals, which has led to blockages and difficulties in delivering animals to slaughterhouses.

The effects of ASF on pork production can also be seen in the 15.3% decrease in meat production obtained in 2020

(498.1 thousand tons live weight) compared to 2016 (588.1 thousand tons live weight) (figure 1).

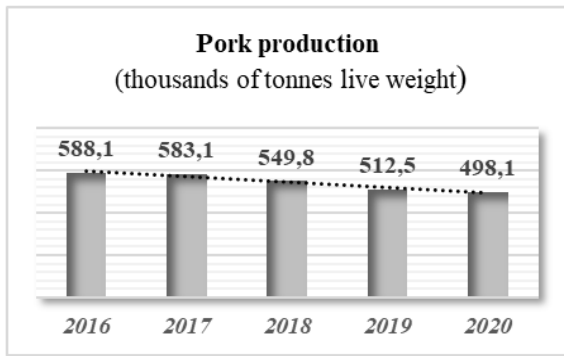


Figure 1: Evolution of pork production in the period 2016-2020 Source www.insse.ro/time-online

In the period 2016-2021, the average annual purchase price per kg live weight on delivery from the farm increased by 16.5%, from 5.34 lei / kg live weight in 2016 to 6.22 lei / kg live weight in 2021 (figure 2).

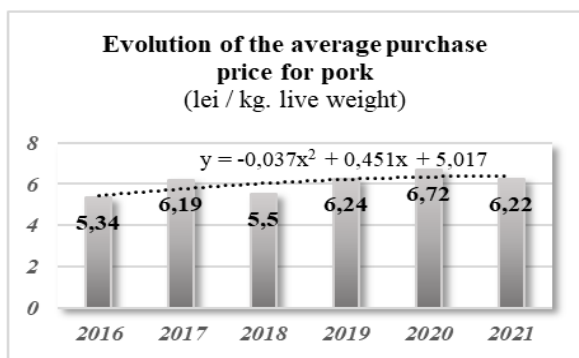


Figure 2: Evolution of the average purchase price for pork, during 2016-2021 Source www.insse.ro/time-online

The depopulation of some commercial farms due to PPA caused the price to increase rapidly due to the fact that there were fewer pigs on the Romanian market. On the other hand, pig farmers in Romania are customers of breeding farms in Western countries (Denmark, the Netherlands, etc.) that have not sold piglets and pork within the EU, only in small quantities, the vast majority of production being exported. on the Asian market. This has put pressure on both Romanian producers, who lack piglets and fat pigs, as well as processors who lack the raw material.

4. CONCLUSIONS

The emergence and spread of ASF outbreaks has had a negative impact on the pig farming sector due to the imposition of restrictions on the movement of animals, which has led to blockages and difficulties in delivering animals to slaughterhouses. Another aspect was the emergence of the feeling of insecurity among farmers, materialized by the reduction of the population and

repopulation due to the risk of new ASF outbreaks in the vicinity of farms, which would lead to the immediate application of restrictions on the movement of animals.

The large number of sows killed to prevent the spread of ASF had a strong effect on the breeding segment, leading to an increase in the price of piglets for fattening and greatly affecting the profitability of breeding and fattening farms. Due to the restrictions deriving from Decision no. 709/2014 regarding the regionalization applied to Romania, the deliveries of live animals outside the country were banned, which determined the loss of foreign markets and the decrease of the price at which the production was capitalized.

Pig farmers in Romania are more affected by fluctuations in the price of pork on the European market, as in periods of high prices, due to the ban on delivery abroad, they did not have access to foreign markets, being instead forced to cope. the fierce competition of the producers from EU countries in the periods with low prices, a situation that led to the decapitalization of the Romanian producers.

ASF is not only Romania's problem but the European Union's problem. Within the EU, Romania has a special situation due to the structure of the pig breeding sector, namely the fact that over 75% of the pig herds are raised in households, so the social impact of the ASF is considerable. The solution to eradicate the disease must be comprehensive and functional and must be applied uniformly across all categories of holdings.

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