STUDY REGARDING BREEDING AND EXPLOITATION OF MANGALITA SWINE BREED IN ROMANIA AND AT EUROPEAN LEVEL

NEAMȚU ALIN[1], MUNTEAN MARIUS[1], VĂDUVA LOREDANA[1], PETROMAN IOAN[*1]
[1] University of Life Sciences "King Mihai I" from Timisoara, Faculty of Management and Rural Tourism, Romania
Corresponding author's e-mail: i_petroman@yahoo.com

Abstract: *Ensuring the necessary swine meat according to the needs of the market requires resorting to obtaining it in other production systems, using traditional, rustic breeds, resistant to outdoor exploitation conditions, due to the special quality of the meat and the high demand for traditional products with long service life, because the classic industrial system does not meet the needs of the processing industry. Obtaining constant productions in the alternative production system, using swine from the Mangalita breed, implies the constant maintenance of herds and the increase of individual productions, for the efficiency of exploitation, through managerial biosecurity measures that contribute to the improvement of technological indices and the provision of an increased amount of meat. All color varieties of the Mangalita swine breed have lower technical parameters in all economic indicators compared to modern swine breeds, but due to the special quality of the meat and the high demand on the market, the breeding and exploitation of the breed is an alternative for small professional farms and environments for their economic recovery, due to the special characteristics of the species, the better tolerance to climatic conditions and the high capacity to convert plant resources from the pasture into meat.*

Key words*: swine, Mangalita breed, herds*

INTRODUCTION

The perception of the importance of raising and exploiting animals for meat production and their health and their relationship with farm biosecurity has increased in recent years with the emergence and re-emergence of several difficult-to-control diseases [9,14,18]. This is evident especially raising pigs in alternative production systems, to cover the meat requirement [10,13,19], as shown by recent episodes of African swine fever. In addition, a better biosecurity can help improve productivity and the exploitation of a lower number of brood stocks can contribute to:

- maintaining constant livestock and increasing individual productions [5,7,12];
- ensuring a larger amount of meat;
- diversification of production systems;
- reducing the impact on environmental factors.

Livestock and farm biosecurity can be defined as the application of management measures aimed at reducing the risk of introduction (external biosecurity) and further spread of pathogens on the farm (internal biosecurity). Thus, the key idea is to avoid the transmission of pathogens either between farms or within the farm, which involves the control of swine herds, a good knowledge of the epidemiology of diseases specific to swine and humans, which must be avoided, but also the ways of transmission [6,8,11].

For the efficient design of farms, the implementation of the most efficient production management and the exploitation system, classic or alternative, studies are required regarding:

- the resources, the breed or the hybrid that will be exploited, the expected production;
- the biosecurity program, the risks regarding the location of the farms and the tradition of exploiting the species in that area;
- measures to reduce the impact of exploitation on food safety.

Achieving constant productions in different exploitation systems requires the maintenance of constant herds in farms, through biosecurity measures and the

improvement of technological indices, for the delivery of the largest possible number of fat pigs per foraged sow. Achieving quality carcasses in the slaughterhouse [4,16,17] requires the integration of production, producer, processor, distributor and perfecting the flow to processing because this process is very stressful and can lead to deterioration of carcasses or even death during transport. While it can be argued that the death of the animals is inevitable anyway as the animals will die in the slaughterhouse anyway, the fact that they are so vulnerable on the route gives an idea of how terrible the conditions of the journey are and what they go through during the journey [1,3,20].

Various studies have shown that the most stressful period of travel for pigs is loading and unloading: a pig's heart rate increases significantly while being loaded, gradually decreases as soon as it gets used to being on the vehicle, then increases again during unloading, indicating that both loading and unloading are stressful processes. These changes in heart rate are the result of both physical effort and the psychological effect of being taken out of housing, when the pig is taken from the only place it knows and taken to new places and mixed with other unfamiliar pigs.

Analysis of aspects related to exploitation, maintenance system, production quality [20] and aspects related to welfare and biosecurity [2,15,20] contribute to achieving the expected meat production and the constant maintenance of swine herds with effects:

-total and individual production;

- avoiding production losses associated with arrival at the slaughterhouse;

-obtaining quality carcasses;

- satisfying preferences of consumers from the market [17,19].

MATERIALS AND METHODS

Failure to ensure the necessary conditions for the breeding and exploitation of swine for meat contributes to the non-realization of the predicted productions, the mixture of herds having undesirable effects on the quality of the carcass and pork meat and on the biosecurity of the farm. Increasing production by maintaining the constant herds requires measures that must be implemented in farms with large financial efforts, regarding the quality of fodder, in order to achieve production in classic systems, according to the needs of the market, but the constant lack of meat provision, causes small professional farms to produce meat at lower prices, in alternative systems using local resources. These productions obtained in alternative systems require the existence of sufficient biological material, from rustic breeds, resistant to exploitation in open air and land for the establishment of farms in areas with cheap and sufficient fodder resources. As part of this scientific approach, were analyzed the herds and productions of a rustic breed, with a high degree of adaptability to exploitation in alternative systems and which can cover a part of the existing deficit from the swine market.

RESEARCH RESULTS

In raising and exploiting the Mangalita swine breed in alternative outdoor or pasture systems, production must be organized according to the resources of the area, the traditions of the area and the market demand for traditional products, integronic management aiming to maximize strengths and opportunities and minimize weaknesses and threats to the professional farm. Strengths can be maximized due to the high market demand for Mangalita swine meat, obtained in alternative systems due to the prices and unavailability of red meat substitutes, much lower feed costs than other industrial production costs of meat, the relatively small area of influence of the market through the relatively small offer of meat and meat products, the good profitability and average incomes. The opportunities of exploiting that traditional, rustic and resistant breed in

alternative systems can be, self-employment, capital of the farm for the procurement of biological material that makes good use of plant resources and cereals in the area and the rising demand for products containing up to 70% unsaturated fats, good fats, being a means of alleviating poverty by increasing the added value. Pigs from this Mangalita breed, due to the special properties of meat and fat, like olive oil and salmon fish, can be called "olive oil with four legs" or "salmon pig". However, in the breeding and exploitation of this breed with valuable quality attributes, much valued by consumers, there are also weak points and threats that are imposed by the measures imposed by integronic management that must include quality, veterinary health and environmental risk management. The identified weaknesses are:

• national traceability program and marketing facilities;
• less qualified human resource, due to manual work, than in other meat industries;
• less performing meat processing infrastructure;
• weak market supply chain;
• low level of objective grading of meat quality in the Mangalita breed;

The threats faced by the Mangalita meat production industry in alternative systems are epizootics, imports of Mangalita meat products from European Union or non-EU countries, European or national policies regarding exploitation and price volatility. We consider that the exploitation of Mangalita breed in alternative systems is good if the following economic indicators are obtained and the swine transform certain grain by-products, green fodder into valuable nutritious meat:

- the investment cost reimbursed quickly (12-14 months) due to small investments in constructions and equipment;
- sow utilization indices of 2.1 farrowing per year and prolificacy of 9-11 piglets;
- achieving during the fattening period an average daily gain of 550-650 grams per day, with balancing and supplementing the rations with concentrated feed;
- feed conversion 3.6 kg of feed for one kg of meat;
- good recovery yields of over 75%.
- exploitation of swine in optimal lots, to avoid environmental degradation;

The evolution of herds and productions of the Mangalita breed, at the national and European level, is presented as follows:

- at the European level, there are no recent data on the numbers;
- color varieties are not researched regarding productions;
- the most recent data are from 2003 at the national level and refer to the period 1983. It is found that the 500 heads of Mangalita swine in 1983 were in Romania, the decrease in their number was caused by the increase of industrialization in the field, a totally inappropriate breeding system for the Mangalita breed.

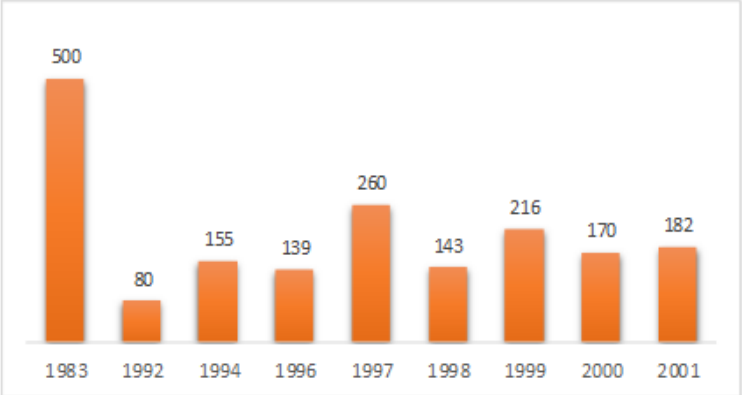

Figure 1. Swine populations of the Mangalita breed from Europe (1983-2001)
Source: according to Egerszegi et al., 2003 [5]

The distribution of Mangalita swine herds by European countries placed, in the same period, Romania on third place, at a short distance after Switzerland and Germany (Figure 2).

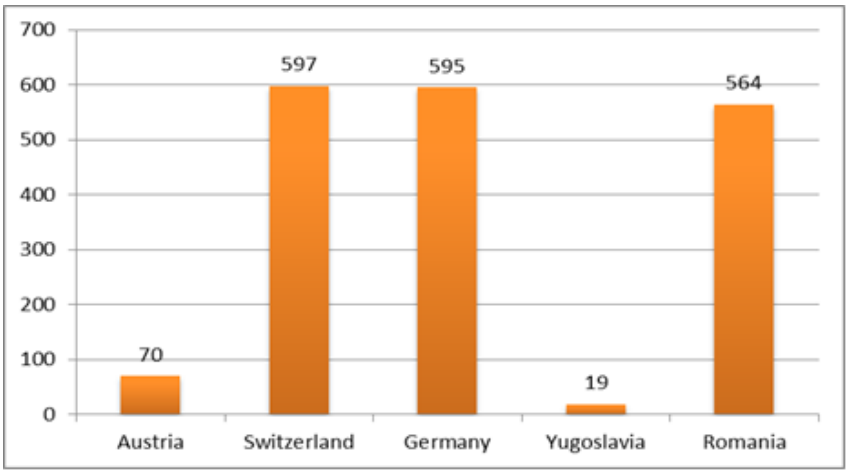

Figure 2. The numbers of pigs from the Mangalita breed by European countries (1983-2001)

Source: according to Egerszegi et al., 2003 [5]

In European countries, Mangalita swine breed herds are small and are exploited in small professional farms in a traditional system. More recent research in Hungary compared the prolificacy and growth performance of color variants of the Mangalita breed and also the factors that determine the indicators examined in 2000 and 2011 based on official Hungarian data. The frequency of farrowing, the number of days between two farrowing and the age at first farrowing of sows from the Mangalita breed, on the one hand, and the weight of day-old piglets and the lactation capacity of sows at the age of 21 days were partially analyzed.

It can be stated that all color varieties of the Mangalita swine breed have lower technical parameters in all economic indicators compared to modern swine breeds or commercial hybrids, but due to the special characteristics of the species:

- reproduction conditions;
- longer growth period to reach the optimum slaughter weight;
- better tolerance to climatic conditions due to the hardiness of the breed.

Some economic factors, the type of farm, the global economic crisis, damage caused by drought, specific diseases, the price of feed, plague in general, affect the performance of the breed. Small professional farms raise purebred Mangalita under traditional conditions and professional farms with medium herds also use crossbreeds obtained by crossing Mangalita breed sows with meat breeds for better performance.

In Serbia, the population of Mangalita swine breed was, between 2009 and 2017, the one indicated in Figure 3.

We can see the upward trend of the herds since 2013, when these herds, due to the quality of the products obtained, tripled in the period 2013-2017, a fact that also determined the increase in productions.

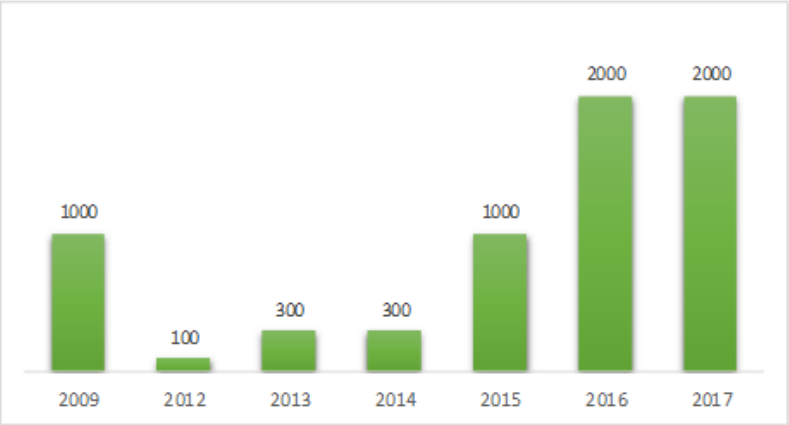

Figure 3. Pig population of the Mangalita breed in Serbia (2009-2017)
Source: according to Egerszegi et al., 2003 [5]

As far as Romania is concerned, in 2018 there were 336 farms where were raised bulls from Mangalita breed. The distribution of these farms by county is shown in Figure 4. It should be noted that the counties of Mures, Arad and Cluj are at the top of the ranking with 60, 40 and 37 farms, respectively, while other counties, Arges, Botosani, Constanta, Iasi , Tulcea and Vrancea do not have any such farms.

In Romania, since 2015, the Mangalita and Bazna Autochthonous Swine Breeders Association (headquartered in Arad, Arad County) has been active, accredited for the service of drawing up and maintaining the Genealogical Register for the Mangalita breed. The association aims to preserve and manage these two breeds in pure form and create a national market for traditional Mangalita and Bazna meat products. In Timis County there is a safe farm, where we conduct the research and the results will be published in future works.

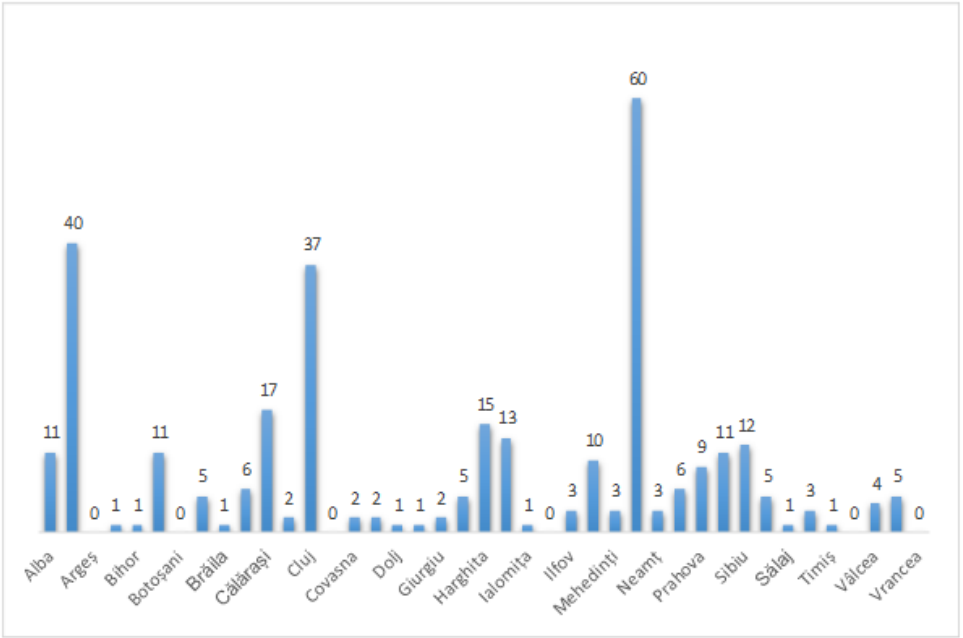

Figure 4. Distribution of pig breeding farms of the Mangalita breed in Romania, in 2018
Source: according to Egerszegi et al., 2003 [5]

CONCLUSION

In raising and exploiting the Mangalita swine breed in classic outdoor or pasture systems, production must be organized according to the resources of the area, the traditions of the area and the market demand for traditional products, integronic management aiming to maximize strengths and opportunities and minimize weaknesses and threats to professional swine farming. Economic factors, the type of farm, damage caused by drought, specific diseases, the price of feed, affect the performance of the breed and the trend of swine herds for these reasons at the European level, small professional farms grow purebred Mangalita in traditional conditions and professional farms with medium herds, for the continuity of production and the efficiency of exploitation, it uses crossbreeds obtained by crossing sows of the Mangalita breed with meat breeds to obtain superior performances. In Romania, the sow herds of the Mangalita breed are reduced with a distribution in 336 farms, most herds being concentrated in the counties of Mures, Arad and Cluj.

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