

## TYPES OF PRODUCTION SYSTEMS FOR SWINE MEAT PRODUCTION

TARPIAN IOANA DENISA<sup>1</sup>, PETROMAN IONUȚ MIRCEA<sup>1</sup>,  
VĂDUVA LOREDANA<sup>\*1</sup>, PETROMAN IOAN<sup>1</sup>

<sup>1</sup>*University of Life Sciences “King Mihai I” from Timișoara,  
Faculty of Management and Rural Tourism, Timișoara, Romania*

\*Corresponding author's e-mail: loredana\_heber@yahoo.com

**Abstract:** *Diversification of swine meat production systems can be a viable solution in supplying the local and regional market, because is an upward trend in consumption. Intensive and super-intensive production systems can no longer meet the consumption needs of swine meat and swine meat products from the market, necessitating massive meat imports. To reduce imports, alternative production systems of rearing and operating swine for open-air, pasture and extensive meat production can cover part of the market demand, providing when consumer demands are high, artisanally processed meat and meat products to the local and regional market from the areas where there are breeds adapted to alternative exploitation and sufficient local resources at low prices. Even if the alternative systems ensure the supply of the market with certain quantities of meat and meat products, a major role in ensuring the constancy of supply falls to the intensive and super-intensive production systems.*

**Key words:** *swine, production systems, meat*

### INTRODUCTION

The swine species, globally, is exploited for the production of meat and fat, in a variety of production systems that vary, depending on the degree of endowment of the farm and the intensity of production in: [7,9,13,19]

- non-professional farms that exploit a small number of animals for the production of self-consumption and the surplus for the local market;
- small professional farms, not integrated in the meat production flow;
- professional swine farms in an alternative swine system;
- medium-sized professional farms integrated in the swine sector;
- large industrial-type professional farms that produce the largest amount of meat intended for use on the market in integrated production systems. [1,6,10]

In countries with a poorly developed economy, the entire swine production system is not integrated, the halls for maintenance, farm management and nutrition are not controlled, it is produced inefficiently for consumption, the activity being alternative to other occupations, using the local resources to ensure the need for protein in isolated, poorly developed areas and with few financial resources for investments in the efficiency of the production system. In these non-professional farms, swine intended for fattening are:

- maintained in simple shelters built from local resources, without heating possibilities, automatic water administration, excrement evacuation;
- to obtain meat, local breeds and hybrids are used, late but which efficiently use green fodder and roots, the animals being resistant to extensive traditional exploitation and to specific diseases; [2,11,16,22]
- few management inputs and animal welfare assurance, in general shelters are improvised for protection against sunlight and rain and do not provide the microclimate factors necessary for efficient exploitation for meat production;
- unbalanced nutrition, because fodder residues from household activities, fodder from the pasture, forest resources and less grains are used, these being used in feed as such and not shredded in the last part of fattening;

- the gregarious, herd character makes pigs from native breeds look for their food, being able to withstand exploitation in the open air, on pastures, in the forest, bringing for the communities: [4,8,12,15]

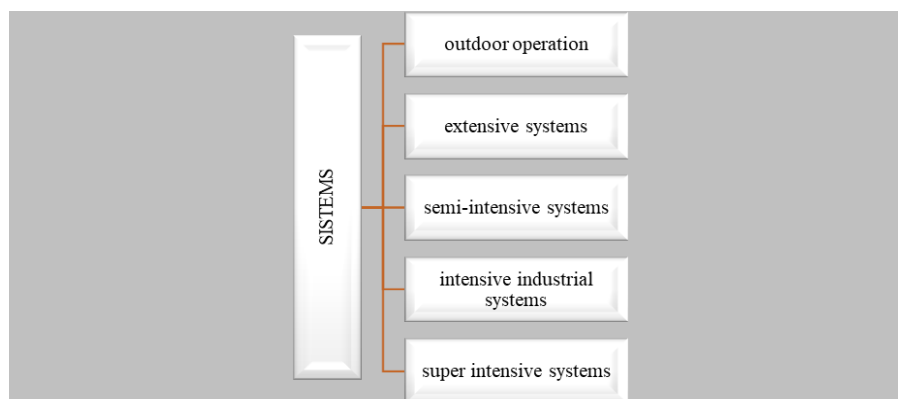
- a good contribution to ensuring the protein requirement;
- a possibility of obtaining specific ecological products: ham, hamon;
- the promotion of some areas and the sustainable development of some isolated communities, through the development of some forms of farm, gastronomic tourism or the purchase of traditionally processed ecological products;
- obtaining alternative pork products and improving the profitability of the exploitation of some breeds and crossbreeds with a low degree of selection and improvement.

Instead, small, medium and large professional farms are specialized for commercial production and ensure constancy in the meat chain, the intensity and economy of the production system resulting from: [3,18,21]

- inputs in farm management and the use of biological material with a high degree of production specialization;
- balanced protein-vitamin-mineral nutrition depending on the expected meat production and the constancy of supplying the market with meat and processed pork products;
- maintenance environment suitable for ensuring well-being with the control of microclimate factors;
- the protection of the biosecurity of animals, farms and local communities, through risk security measures regarding veterinary sanitary and environmental management;

Considering these characteristics of swine farming systems for the production of meat, fat or bacon at a local, regional, national or global level, we distinguish at least five production systems, divisible according to area, feed resources and maintenance systems. These production systems can be the following in raising and exploiting swine for meat depending on the intensification degree of production: reproduction, maintenance, nutrition, constancy of production, farm management and marketing management: [5,14,17,20]

- production systems with the exploitation of swine in the open air;
- extensive production systems;
- semi-intensive production systems;
- intensive-industrial production systems;
- super-intensive production systems.



**Figure 1. Types of production systems at swine for meat**

*Source: own creation*

## MATERIALS AND METHODS

The increased consumption of proteins of animal origin requires actions to modernize the systems of raising and exploiting swine, the productions obtained had an upward trend and the existence of a high-performance processing industry makes the recovery yields higher and the meat market be regularly stocked with a wide variety of cuts of swine meat and swine meat products. Due to the high demands of consumers, for swine meat and swine meat products, which are second in preference after poultry, classic production systems can no longer cover the needs of the market, for these reasons within the framework of this scientific approach, we are looking for implementation, new alternative production systems and technical solutions to increase individual productions and with the use of local nutritional resources, to obtain cheap and quality products that satisfy the needs of consumers on the swine market.

## RESEARCH RESULTS

Because the classic production systems of raising and exploiting swine are not able to ensure the rhythmically increasing need for meat on the market, it is necessary to implement new measures to increase production without affecting environmental resources, but also to diversify production systems, by using local nutritional resources, for the production of meat in alternative outdoor and pasture farming systems. For the constant supply of the market, we propose for implementation for the researched area the use of the following production systems, for the constant supply of the market with swine meat and swine meat products, from domestic production and the abandonment of massive meat imports:

1. The production system with the exploitation of swine in the open air, a system characterized by the following aspects regarding obtaining the economic production of meat:

- meat can be obtained using the following growing technologies:

a. outdoor exploitation in improvised shelters with access to the paddock in the hilly area;

b. grazing during the day in the herds of the community on pastures or meadows with the provision of water and lodging with the owners during the night;

c. forest exploitation on a production cycle, using forest resources for ecological productions;

d. exploitation in summer camps organized by communities of owners;

e. exploitation in stables, bullfighting camps, together with other species of animals, for the use of waste resulting especially from milk processing;

f. exploitation around grain processing units for the purpose of obtaining beer.

In order to obtain economical productions in this production system, we propose the use of:

- rustic livestock from the Mangalița and Bazna breeds, specialized for outdoor exploitation, resistant to bad weather, diseases and with a high capacity to use industrial waste and cellulose;

- young and fat pigs are resistant to the action of the sun's rays, they can move over large areas in search of food, water and shade;

- they produce meat with special organoleptic and physicochemical properties that lend themselves to traditional processing to obtain products with a long shelf life;

- contributes to the efficient use of resources that other species do not use, contributing to the sustainable development of isolated areas.

2. The production system with the extensive exploitation of swine is characterized by the fact that:

- meat is produced in small and large quantities, for self-consumption and market by exploiting swine in:

a. small non-professional farms for self-consumption using 2-4 pigs for meat production;

b. medium non-professional farms of 5-10 heads, which produce for self-consumption and the local market;

c. modernized non-professional farms that produce meat seasonally, for the local and regional market;

d. non-professional associative farms that produce and process the meat obtained in summer camps, for the regional and national market;

- the animals used for growth and fattening come from white breeds, the Great White and Landrace and mestizos with an average degree of improvement;

- shelters that protect animals and with automatic water administration systems are used for maintenance;

- nutrition is balanced or not depending on the purpose of utilization, for self-consumption or the market;

- it is possible to balance the meat balance and efficiently use the household and plant resources in the area;

- associating owners for better processing can contribute to improving the economic efficiency of swine farming in this extensive system for meat production;

- the system has possibilities for development if minimal investments are made in the systems of maintenance, nutrition management, processing and valorization of meat on the market during the periods when this meat product is in demand on the market.

3. Production system with semi-intensive exploitation of swine for meat production. The system is characterized by the following elements:

- meat is produced in large quantities in the following types of holdings:

a. large non-professional farms of 50-150 fattening swine per series, where shelters have been modernized and water administration is done automatically, feed administration and manure removal is done manually;

b. professional farms of more than 200 heads per series of fattening pigs, with an average degree of automation and mechanization of production activities;

c. associative units that produce swine meat seasonally depending on the fodder resources.

These units are modernized, they ensure comfort and well-being of fattening swine, but they have not solved the management of manure and constancy in the supply of meat and meat products to the market:

- the livestock are specialized for meat production and come from mestizos of white breeds crossed with meat breeds and with a high degree of adaptability to exploitation in a semi-intensive system;

- have technologies to ensure fattening in 4-5 months and reaching a weight of 110 kg;

- nutrition control allows achieving good productions, growth increments and conversion rates at reasonable prices;

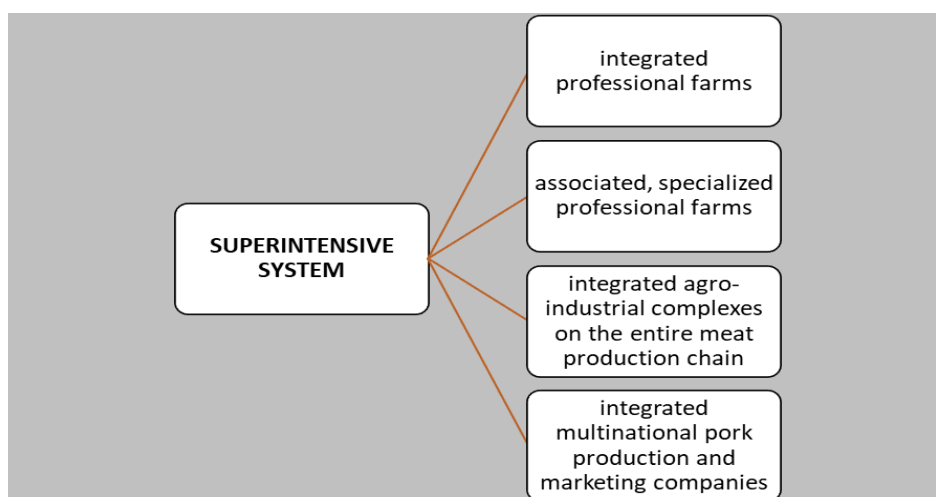
- provides a part of the pork needed for the processing industry.

4. The intensive industrial production system is characterized by the fact that:

- meat production is carried out in:

a. modernized non-integrated professional farms, which have high-performance technologies;

- b. professional farms integrated into the meat production flow;
  - c. professional farms with an open meat production circuit;
  - d. professional farms with closed circuit.
- the biological material is of specialized quality for meat production;
  - the exploitation technologies are modern with the automation and mechanization of the systems that compete for production;
  - have implemented production, production quality and environmental risk management;
  - use nutrition systems appropriate to the expected production;
  - are able to provide the processing industry with raw materials;
  - have an effective management of distribution and capitalization;
  - production is integrated throughout the meat flow, production, processing and utilization.
5. The super-intensive production system for obtaining swine meat. This production system is characterized by the following elements:
- swine meat is produced in large batches in:
    - a. professional farms integrated in the meat chain, with a high degree of technicality;
    - b. associated professional farms, specialized in selection, breeding, breeding activities, industrial breeding, juvenile rearing and fattening;
    - c. integrated agro-industrial complexes on the entire meat production chain, production raw materials for feed, obtaining feed, obtaining production, slaughtering, processing, distribution and superior utilization of meat and meat preparations;
    - d. integrated multinational swine production and marketing companies.



**Figure 2. Super-intensive production systems of swine meat**

*Source: own creation*

- farms have implemented the most top integrative management;
- high degree of training and specialization of the human resource;
- the best nutrition information and knowledge management system, marketing processing and management;
- regulates demand and supply as well as the price of meat on the international meat market;
- ensures a high degree of exploitation profitability by integrating productions.

## CONCLUSIONS

Small, medium and large well-managed professional and non-professional farms, specialized for commercial meat production in classical and alternative systems, can ensure constancy in the meat chain, intensity and economy resulting from inputs in farm management and the use of biological material with a high degree of specialization of production, and adaptability to export conditions can ensure the constancy of the market supply of meat and processed swine products. Alternative outdoor, pasture and extensive production systems through better processing can contribute to improving economic efficiency of exploitation, this system having development possibilities if minimal investments are made in the maintenance systems, nutrition management and the utilization of meat on the market during the periods when this meat product is in high demand on the market.

Even if the alternative systems cover up to 10% of the needs of the meat market, through the production potential, a major role belongs to the intensive and super-intensive production systems, which have the main role in ensuring the demand for meat, something that can only be done by increasing individual productions, with the management control of the use of resources without affecting the environmental risk factors in the area of farms and local communities.

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