

Swine Breeding in the Villages of Vâlcea County

Subjects: Agricultural Economics & Policy

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Food supply has been a constant source of concern for mankind. In the present context, with food security a priority of European and national policies, an analysis of pig farming in a representative NUTS2 administrative level of Romania that emphasizes the proportion of households raising at least one pig and the main factors influencing farmers to adopt or give up swine breeding could allow a much clearer understanding of this phenomenon that lies at the border between cultural tradition and socio-economic necessity.

Keywords: animal breeding ; economic crisis ; local culture ; rural economy ; cluster analysis

1. Introduction

Swine and animal breeding are aimed at meat consumption ^{[1][2]}. Meat consumption, including pork, has reached notably high values ^{[3][4]}, with the trends reflecting the growing increase in meat consumption ^{[4][5]}, as meat is an essential food that serves as an important source of protein and fat ^{[2][6][7]}. The OECD-FAO (2021) report ^[8] estimates an increase of 14% in the global consumption of meat proteins this decade compared to average consumption in 2018–2020 driven by urbanization and income and population growth ^[4]. Protein consumption from pork is projected to increase by 13.1%. This protein source is the third-most consumed after beef (estimated to grow by 17.8%) and lamb (estimated to grow by 15.7%) ^[8]. In the European Union, the average consumption of pork is 41 kg/person, which is 3.28 times higher than the average global consumption (12.5 kg/person) ^[9]. The EU is also the biggest producer of pork after China and the biggest exporter of pork and its associated products. Its exports were recently boosted by a decrease in production in Asia due to African swine flu, which led to a price peak for pork products in early 2020 ^[10]. According to the same European Parliament briefing report, pigs represent the largest livestock category across the EU, even more than bovines, and account for nearly half of the total EU meat production.

Studies have confirmed that Eastern Europeans are traditional meat eaters and researchers have observed an increase in the production of pig meat ^{[4][11]} and poultry on the European meat market ^[11] compared to other consumer patterns that show preferences for beef or lamb.

In Romania, meat consumption has increased in recent years from 54.4 kg/person in 2013 to 76.7 kg/person in 2021. Pig meat is the most frequently consumed meat product, with about 50% of the total national meat consumption (38.3 kg/person), surpassing poultry (27 kg/person) ^{[12][13]}.

When considering the importance of swine breeding ^[14], this activity, along with plant and cereal cultivation ^{[15][16][17]}, can help to meet the food needs of a continuously growing world population and achieve food security ^{[17][18][19][20][21]}.

Finding food sources has been of great concern to humans for a long time ^[22]. Domestic pigs spread throughout central and southern Europe around the Mediterranean Sea and along large European rivers, reaching territories to the north of the Danube River in 5500 BC ^[23]. According to different sources, swine breeding has existed within the Romanian territory since ancient times ^[24].

Romania has an interesting history of agricultural occupation and market development within the EU. It is one of the primary pork-consuming countries in the EU, with a strong tradition of homemade pork production and a wide array of pork-based dishes, although the per-capita consumption is slightly lower than the EU average (38.5 kg/person compared to 41 kg/person) ^[25].

Pig livestock numbers in Romania have decreased significantly in the last few decades, from about 12 million in 1990 to 4.79 million in 2000, decreasing to 3.92 million in 2018, and then to 3.54 million in 2021 according to the National Institute of Statistics press release no. 232 from 15 September 2022 ^[26]. This is in contrast with other countries in the EU, which

have more intensive production (including Spain, Germany, France, Denmark, and the Netherlands). However, the EU is the main source of pork imports for Romania, which maintains high consumption and demand of these products on the local market, thus making them an important part of the EU market. According to studies of Eastern European meat consumer patterns, a significant percentage of the Romanian population consumes pork on a daily or weekly basis ^[11].

2. Swine Breeding in Romania

When analyzing the scientific literature on the topic of swine breeding and its specific characteristics in Romania, several perspectives are evident. One is the examination of the importance of swine breeding as a source of food and nutrients ^[1] ^[2] and the role of fresh pig meat in human nutrition ^[2]^[4]^[7]^[9]. Domestic pigs represent the second-most important global source of meat ^[27].

The growing world population needs adequate sources of protein to maintain food security ^[20], and undoubtedly, proteins of animal origin will remain an important part of the global food system ^[25]^[28]. Consequently, animal breeding is estimated to intensify in the future ^[25]. The demand for high-quality proteins has influenced the design of several innovative solutions in recent years (e.g., the use of algae for animal feed to increase the quality and nutritional value of pork and poultry) ^[29]. Some studies have highlighted recent efforts toward conventional rotational cropping ^[30], as well as improvements in cropping techniques and fertilization to increase both yields and crop health ^[16]^[31]. Other studies have proposed viable solutions such as reductions in supply chains ^[15], particularly in the current context in which the Russian invasion of Ukraine affects global food security, ^[32] as well as for certain African countries that are dependent on cereal imports ^[21] ^[33]. To increase meat production, there has been a focus on the genetic improvement of pigs through selective breeding aimed at enhancing meat output and resistance to diseases, ultimately leading to greater efficiency in swine breeding ^[34] ^[35]^[36].

Another research perspective focuses on environmental protection, including ecologically sustainable solutions for animal and swine breeding, and on diseases that can affect animals and result in critical economic, social, and ecological damage ^[1]^[14]^[27]^[37].

A third perspective focuses on the economic importance of swine meat and its consumption, as well as on the breeding and valuation of pig livestock ^[3]^[4]^[5]^[6]^[11]. Several studies have focused on an analysis of the demographic factors of swine breeding activities ^[11]^[38].

In Romania, swine farming has been influenced by a number of factors. Among them were the profound economic and political changes in 1990, which brought about significant transformations regarding land reform ^[22]^[39]^[40]. In addition, the “adaptation of the production structures to the new free economy requirements” should not be overlooked p. 293, Ref. ^[39].

The profound political and socio-economic changes also influenced the emergence of free trade and the access of the Romanian population to products other than local ones, especially products from European markets. These changes also led to periods of economic recession (e.g., 2008–2010), oscillating rates of inflation, population aging, and high rates of employment in agriculture, particularly in rural areas. All these factors influenced the trajectory of individual households and greatly impacted swine farming in rural environments in Romania ^[41].

The present context also induced other supplementary, important economic stress factors, such as refugee crises (faced by the EU and Romania, in particular, in 2016 but also at the present moment because of the conflict in the nearby region) ^[42], the SARS-CoV-2 pandemic, and the energy crisis, as well as repetitive health crises such as African swine flu, the most recent outbreak of which was confirmed in October 2022 ^[43], which is of particular concern to pig farmers in Romania. The great economic losses due to swine flu influenced government measures that materialized through legislative acts such as Government Decision no. 830/2016 ^[44], which introduced supplementary measures to prevent the occurrence of African swine flu in Romania, and again emphasized the importance of swine breeding in the local landscape.

At the same time, the growing number of pigs in rural farms is influenced by economic necessity ^[45]^[46] and is permitted due to the privatization and liberalization of the agricultural land market in both rural regions and on the outskirts of urban areas in Romania ^[47] since the fall of the communist regime in 1990. The threshold between tradition and economic necessity for agricultural occupations is influenced by other factors, such as the development of the local economy, the employment rate, the income per household, and the average age of inhabitants in each settlement. Studies ^[38]^[48] show that between 2018 and 2019, the employment rate in agriculture was generally high, with spikes observed in the Southern and Eastern counties. Moreover, the excessive fragmentation and division of farms in Romania's agricultural holdings into

multiple small plots have led to a high prevalence of subsistence and semi-subsistence farming, with small-scale family farms focusing on both social and economic benefits ^[49].

A challenge for small farms is to cover the target level for food self-sufficiency through their meat production. Another challenge for rural development in Romania is the significant aging of the rural population ^[50], which underscores the need to prioritize this domain in local development efforts by identifying viable paths for growth ^[51]. According to some studies, remote rural areas have a high percentage of elderly residents who are particularly vulnerable due to a lack of essential services that address their current needs ^[52].

After 1990, important socio-economic transformations in Romania influenced the fluctuating relationship between consumption, animal breeding (especially swine), and family savings. Studies show that in the post-socialist period, consumption became a priority and savings rates even became negative between 2000 and 2010 ^[51]. This phenomenon can be explained by both the decrease in the number of livestock and the influence of demographic factors (e.g., farmers' aging). After 2010, new modern, small-sized rural farms for swine breeding appeared. Private savings and bank loans were mainly used to fund very small farms (5–10 pigs), whereas bank loans and sometimes European structural funds were used to fund small farms (more than 11 pigs). Both categories, especially the latter, are expected to contribute to the development of livestock production in local agriculture ^{[49][52][53]}. The analysis of local solutions used by rural inhabitants to overcome crises, no matter what form they take, is very important to us.

According to Nistor et al. ^[54], the traditional Romanian diet is based on meat and pork. Pork is the preferred meat of Romanian consumers and comprises about half of the total national meat consumption. Moreover, despite some worldwide and regional dietary trends that emphasize healthier food choices, particularly in developed, high-income countries in the EU ^[8], annual meat consumption in Romania has increased from 54.4 kg to 76.7 kg per person, with a particular preference for pork consumption. As meat production decreased, pork imports increased in Romania, doubling in the first nine months after joining the EU and covering about 70% of the domestic demand of local industry processors ^[54].

This situation can be explained by the fact that pig breeding in Romania mainly occurs on private, household family farms, further emphasizing the preservation of a traditional occupation. Pig breeding and their slaughter before Christmas has been celebrated for hundreds of years in Romania and numerous symbols and laic rituals were added to this event that occurs on 20 December on Ignat day around the time of the winter solstice. The word Ignat derives from the ancient Latin word *ignatus* and was initially used to refer to a solar deity. Over time, the event also took on Christian connotations as it took the name and date of the celebration of the orthodox saint Ignatie Teofanul. The sacrifice of the household pig is, therefore, done on the day of St Ignat around the time of the winter solstice when the sun is at its lowest point in the sky by slaughtering the animal immediately after the sun rises and then cleaning it with fire and water. Therefore, this sacrifice is made to celebrate the rebirth of the seasons, coinciding with the rekindling of the sun, and it is also a purification ritual performed with the help of fire (*ignis* = fire). In ancient times, this ritual was performed to chase away the bad spirits associated with the ending of the dark and cold winter season and ensure the health and prosperity of the family, as well as good crops and fertile land in the new year and the new spring to come ^{[55][56]}. These traditions have been rigorously maintained, especially in rural areas that nowadays advertise authentic cultural tourism, and have influenced the local cuisine and dietary behavior of many Romanian people.

Moldovan ^[57] stated that over 79% of pig livestock in Romania was raised on small individual farms, with pig farms comprising an impressive number of about 1.7 million nationally, with an average of 2.8 heads per farm in 2007. The importance of swine breeding in Romanian communities and its effects on the pork meat sector was emphasized in the European Parliamentary Research Service report, which stated that more than half of pig farms in the EU are located in Romania, which has one of the most polarized pig industries in Europe ^[10]. According to this research, approximately 99% of Romanian pig farms have less than 10 pigs, yet these farms account for half of the country's pig population. This emphasizes the importance of this traditional occupation, which is simultaneously a socio-economic occupation and a cultural feature of the local rural landscape. The above figures support the fact that pork is a traditional product consumed by the general Romanian population.

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