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POSSIBILITIES OF OBTAINING CARCASSES WITH LESS FAT BY IMPROVING TECHNOLOGICAL MANAGEMENT

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Abstract: *The present study aimed to identify and evaluate the possibilities of reducing the fat layer in carcasses by improving the technological management applied in pig farms. The research was carried out based on specialized studies in the field of pig breeding regarding animal density, microclimate, nutrition, and stress management. The analysed parameters included the chemical composition of the carcass, the feed conversion, the muscle mass index, and the thickness of the dorsal fat layer. The results presented in literature highlighted that adjusting the density in the shelter, improving ventilation, optimizing the protein/energy ratio in the ration, and reducing thermal stress determine significant decreases in fat deposits, simultaneously with an increase in muscle mass. The combined interventions generated the best performances, suggesting that an integrated improved model of technological management can contribute decisively to obtaining leaner carcasses and increasing the economic efficiency of farms. The study emphasizes the need for a multidimensional approach to technological factors and provides applicable directions for optimizing production in commercial farms.*

• Introduction

The quality of the pig carcass is one of the main indicators of performance in animal husbandry, and the proportion of fat is an essential element both for the economic evaluation of production and for satisfying consumer demands. In the current context, characterized by an increasingly accentuated orientation towards food products with high nutritional value and low fat content, obtaining leaner pig carcasses is becoming a strategic priority for commercial swine farms. The evolution of consumer preferences, competitive pressure and quality standards imposed by the European market determine the need for continuous optimization of growth technologies and management applied in livestock farms.

Fat deposition in farm pigs is the result of a complex interaction between environmental, genetic, nutritional, and technological factors. If genetic potential sets the physiological limits of growth, the way in which animals are fed, housed, and managed determines the effective way in which resources are directed towards the formation of adipose or muscle tissue. In this sense, technological management – understood as the set of decisions regarding biosecurity, density, growth rate, handling, microclimate, and nutrition – becomes a fundamental tool for guiding animal metabolism towards efficient and balanced production.

Numerous studies highlight the fact that controlling thermal stress, ensuring an adequate microclimate, ensuring an optimal ratio between energy and protein in the ration, and reducing stress factors contribute significantly to reducing fat deposits. At the same time, adapting housing density, improving ventilation, modernizing growth technologies, and using functional additives can directly influence feed conversion and the distribution of nutrients between muscle and adipose tissue. In commercial pig farms, where economic efficiency depends on the ratio between production costs and carcass quality, these interventions become essential for increasing competitiveness.

• Material and method

The material on which this study is based consists of articles, book chapters, MSc theses, and studies conducted in the field of pig breeding in the last 10 years, and the research method used is the bibliographic one. The authors of the study aimed to identify innovations in terms of animal density, carcass parameters, feeding regime, growth parameters, housing conditions, microclimate, and stress management, as well as chemical analyses and evaluation methods (statistical analysis, morphological measurements).

• Results and discussion

Povod et al. (2025) claimed that advancements in pig breeding for increased leanness and improvements in feeding conditions and feed quality allow producers to increase the pre-slaughter weight of pigs without compromising carcass characteristics and meat quality. However, there have also been contrasting views suggesting that higher slaughter weights may increase subcutaneous fat thickness, reduce pig growth intensity, and worsen feed conversion, thus leading to a decrease in lean meat content. Research in the field of swine raising in the last decade (2016-2025) points out the main trends in producing lean pork, important because most hog markets pay the producers based on pork carcass merit, which is determined at postmortem by carcass leanness percentage.

Carcass parameters. Warner, Dunshea & Channon (2018) focused on the development of a non-prescriptive, cuts-based predictive model for use by the pork industry to enable the consistent production of pork of high eating quality and identified significant data and knowledge gaps, i.e. deficiencies in the existing data and studies: impossibility of determining correction factors for multi-factorial interactions between different pathway parameters because of lack of data, lack of a variety of cooking methods and to different cooking endpoint temperatures, lack of data for means or averages, lack of enough studies on immunocastrated male pigs, studies relying on loin muscle alone, and unknown additive / multiplying effect of the factors influencing eating pork quality.

• Conclusions

The following conclusions can be drawn on the possibilities of obtaining carcasses with less fat by improving technological management based on the analysis above:

- Carcass weight alone is a poor predictor of leanness, meaning producers must rely on integrated management rather than simple weight targets;
- Environmental control – especially temperature – is one of the most effective tools for reducing carcass fat;
- Lean pork production is increasingly holistic: feeding, genetics, microclimate, stress, technology, and welfare – all interact to determine carcass leanness;
- Market segmentation matters: non castrated pigs produce leaner meat suitable for fresh cuts but less ideal for cured products.
- Modern breeding enables higher slaughter weights without harming meat quality, but only under optimized feeding and environmental conditions.