STUDY REGARDING THE NUTRITIONAL QUALITY OF MANGALITSA MEAT

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Abstract

The Mangalitsa breed is known as a breed with superior quality properties from which unique and high-quality meat products can be manufactured. Mangalitsa is one of the most well-known breeds of rustic pigs popular in Europe. [1]

This type of breed is a characteristic representative of a fat pig breed, so that of the total body weight, the majority is represented by adipose tissue in a proportion of 65-70%, and the remaining 30-35% by muscle tissue.

Mangalitsa pork is an extraordinary source of vitamins and trace elements, providing between 10% (vitamin B5) and 65% (vitamin B1) of the recommended daily dose. At the same time, it is also an excellent source of various soluble vitamins necessary for the development of a healthy metabolism, such as Vitamin B3, B6, B7 and B12. The minerals found in pork are in the proportion of 9%, represented by iron and 36% of zinc from the recommended daily dose, as well as phosphorus and magnesium.

The fat content found in meat from Mangalitsa pigs is 12-16% less for saturated fatty acids and 8-10% higher for unsaturated fatty acids than in modern pig breeds.

*When consumed in weighted quantities, **Mangalitsa pork is an excellent source of energy**, with beneficial effects on the skin, eyes, nervous system, bones.*

Key words: *Mangalitsa, meat, vitamins, minerals, meat*

INTRODUCTION

In the last years, the interest for indigenous breeds, such as Mangalitsa has been increased significantly, because there was a higher demand for the meat and meat products from these breeds, due to superior sensorial quality. [2, 3]

According to the international trends regarding the advanced meat products, realized from native breeds, these are gaining an important place in this specific field.

Mangalitsa is known as being one of the most popular breeds from Europe, having excellent properties regarding the taste, the marbling and the very reduced amount of cholesterol. [1]

As well, the meat from Mangalitsa has a darker color, is more juicy, smooth and its scent is pithier than the meat coming from different breeds. The industry of raising pigs has an important weight in most of the international regions from all over the world, producing billions of pigs annually.

In the last 50 years, in this field have been registered remarkable changes that haven't been noticed in any other species. For example, we can mention that in our days, there are pig's breeds containing less than 50% fat, than the ones from 50 years ago. [4]

In the world, pork meat constitutes approximately 38% of the animal proteins eaten every day. It is consumed in different

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ways, all over the world, from the well-known burgers or sausages to the Italian prosciutto. Pork proteins are very important and high-quality proteins that are providing the most essential amino acids. [5]

Pork lipids, that are representing 7,5g/100mg meat, are also an important source of conjugated linoleic acid, that according to the last studies conducted by the Department of Food Science and Technology at the University from Nebraska, USA, can be used as a protector against cancer or heart diseases, through its antioxidant properties. [6]

Pork also contains an important source of trace elements and vitamins assuring the needed quantity of B5 vitamin (approximately 10%) and B1 vitamin (approximately 65%) from the recommended daily dose. Also, it is an ideal source of soluble vitamins like B6, B12, B7, B3, that are necessary for a healthy corpus. [7]

Most of the consumers are looking for having exotic products like salmon, Swiss cheese, Argentinian meat, but they are also looking for the products that are offering the daily source of nutrients that are important for the functioning of the organs, and for the increase of the immunity and for the antibody's creation. Around the world, people that are consuming organic food, think that this is very good, healthy and, with good taste.

The meat and the products obtained from traditional breeds, like Mangalitsa are very well known in the social and mass-media, having an awesome image. If it is consumed in mild quantities, pork meat is a very good source of energy, by the essential antioxidants it offers a higher immunity for the whole body. [8]

SUA and most of the European countries (Hungary, Switzerland, Austria, Germany, Spain and UK), over the last decades, have been resuscitate the reproduction of the primitive breed Mangalitsa, due to the excellent qualities of the products obtained from this type of meat. Seeing that Mangalitsa is a fat type of breed, the purpose of these research was to determine the fat, cholesterol and fatty acids from the meat obtained from Mangalitsa breed and from other modern breeds. [9]

MATERIAL AND METHOD

The study was conducted on pigs from 6 different breeds like: Mangalitsa (n=10, 421 age days), Duroc (n=9, 265 age days), Landrace (n=7, 321 age days), Large Black (n=6, 231 age days), Pietrain (n=5, 281 age days) and Large White (n=7, 261 age days).

The pigs have been chosen from 5 different farms from Romania and in the slaughterhouse have been determined the live weights and hot carcasses after slaughtering.

We have been testing chemical analysis on the samples of muscle and fat issues that have been collected from different regions of the body like chop, leg, neck, lard and muscles.

The amount of lipids and cholesterol has been determined in the samples took from muscle and fat tissues. The total lipids of trials have been extracted by using chloroform methanol (2:1, v/v), by an aliquot of total lipid extract. After that, through a gas chromatography we have been analyzed the fatty acid methyl esters. The temperature from the oven was over 200ºC and the carrier gas velocity was 25 cm/s. The injection port was set at 250ºC, and the detector was used at 300ºC.

The final outcomes have been reported as percentages of the total fatty acid established based on the total peak area.

The charts have been drafted using Microsoft Office Excel 2024.

RESULTS

Consumers are interested in the nutritional characteristics of food and the knowledge gained through research

regarding the nutritional factors that affect the composition of meat are particularly valuable.

Most of the consumers aim to have a healthy lifestyle, therefore it is very important to study the fat and cholesterol contents that are found in the meat products.

In Table 1 it is represented the amount of fat and cholesterol found on Mangalitsa meat.

In a comparative analysis of fat content across various meat portions, lard stands out with 79g fat per 100 g, equivalent to an adult's daily requirements. Other meat cuts exhibit lower fat content, with a maximum of 22g per 100g in muscle tissue. Despite Mangalitsa being a breed known for its fat, the cholesterol content in both its meat and lard remains significantly below the recommended daily intake of 300 mg per individual.

Lard contains the highest cholesterol concentration at 140mg/100g, while pork leg shows the lowest 49mg/100g. The fat from Mangalitsa meat is considered high quality, contributing to flavor, palatability and softness of the meat.

Notably, Mangalitsa fat contains 12-16% fewer saturated fatty acids and 8-10% more unsaturated fatty acids (including n-3 and n-6) compared to modern pig breeds. [2]

A comparative study of fatty acid composition from back fat samples from Red and Blonde Mangalitsa and 5 modern pure breeds, all subjected to identical feeding strategies and fattening rations, revealed interesting results. The Duroc breed exhibited the highest ratio of saturated fatty acids at 42.95% while Red Mangalitsa showed the lowest at 35.88%.

Previous studies conducted by researchers, reported slightly lower saturated fatty acid ratios for Duroc (41.2%) and Large White (36.87%).

Interestingly, Swallow - bellied Mangalitsa displayed a higher saturated fatty acid ratio (40.94%) compared to Red or Blonde Mangalitsa. [10]

Table 1. The amount of fat and cholesterol found in meat from Mangalitsa

Components	Fat, g/100g	Cholesterol, mg/100g
Pork leg	7.9	49
Pork chop	9.3	53
Neck	18	56
Muscles	22	69
Lard	79	140
Amount recommended	80 (g/individual/day)	300 (mg/individual/day)

DISCUSSIONS

According to the study made by Szabó et al., (2006), they performed the analyze of the fatty acid composition from back fat samples from 7 pure breeds (including Blonde and Red Mangalitsa) and 3 cross breeds' genotype. [11]

In their analysis, the researchers found that Red Mangalitsa exhibited the lowest ratio of saturated fatty acids (36.99%), while Duroc x Cornwall hybrid showed the highest (44.65%). Among pure breeds, Szabó and Farkas reported the highest saturated fatty acid ratio in Duroc (43.175%). Regarding unsaturated fatty acids, Red Mangalitsa demonstrated the highest ratio (62.76%), while Landrace had the lowest (41.66%). The researchers also observed an even higher unsaturated fatty acid ratio in Red Mangalitsa (63.01%) and the lowest in a Duroc x Cornwall hybrid

(55.35%). For pure Landrace, they reported a considerably higher ratio of 57.16%.

It is widely acknowledged that a lower saturated fatty acid content and higher unsaturated fatty acid proportion are beneficial for human health.

The fatty acid composition in Mangalitsa varieties is influenced by diet, with green pasture consumption increasing fatty acid content, particularly omega 3.

These qualities have contributed to the growing popularity and demand for Mangalitsa meat, lard and related products among consumers.

Consequently, it is crucial for both consumers and producers to have access to reliable information and product certification to ensure the authenticity and quality of Mangalitsa – derived products.

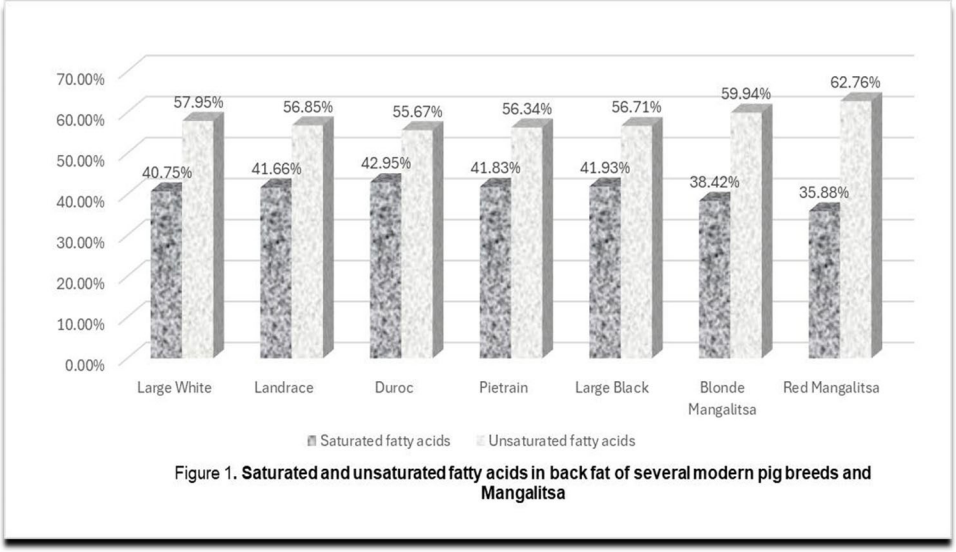

Figure 1. **Saturated and unsaturated fatty acids in back fat of several modern pig breeds and Mangalitsa**

CONCLUSIONS

This study demonstrates that through the implementation of a controlled diet, Mangalitsa pigs produce meat and fat with distinctive chemical composition, characterized by significantly higher levels of monounsaturated fat compared to other pig breeds. In line with current health trends, the preservation of traditional breeds suited for extensive production systems is crucial for maintaining a supply of healthier animal products.

To enhance production traits such as precocity, prolificacy and body weight, crossbreeding Mangalitsa with modern breeds like Large White, Duroc and Landrace may be considered.

Further research is warranted to comprehensively evaluate muscle and fat quality, as well as the sensory and nutritional properties of Mangalitsa meat. A detailed investigation of the fatty acid profile is necessary, with particular emphasis on the effects of traditional feeding practices (e.g., grazing, acorn, and chestnut consumption) on the meat's fatty acid composition and potential health benefits for consumers.

Additionally, consumer preference studies for traditional meat products should be conducted to assess market demand, potentially leading to an increase in Mangalitsa pig populations.

These findings highlight the importance of preserving and developing traditional pig

breeds like Mangalitsa, which may offer unique nutritional benefits and contribute to sustainable agricultural practice.

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