The Influence of Endogenous and Exogenous Factors on Meat Quality of Pigs

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Abstract
Livestock is a tradition for the Romanian area, they capitalizing, in optimal conditions the existing resources in private small family farms and providing energy and protein source for this, in terms of economic efficiency, because feed resources are obtained at reasonable prices. Meat quality is influenced by endogenous and exogenous factors, analyzing the following indicators: the percentage of water in meat, fat, protein from meat from pigs slaughtered at weights of 115-135 kg, meat pH and dry matter content, protein, fat and minerals.

Keywords: age, meat, optimal temperature, quality

1. Introduction
Meat is notable for its nutritious value resulting from the existence, in its chemical composition, of proteins and fats that make it special. Meat is remarkable due to its taste and tenderness, and it is in high demand by consumers due to its marbling and persilation in both fresh and preserved forms. Due to its low degree of wet ability and high fat content, it is recommended in a wide range of products that can be preserved for long periods of time and that are very much appreciated for its taste by the consumers [1, 3, 4].

Obtaining high quality swine carcasses with a high percentage of meat is a major concern for animal breeders who wish to valorise their surplus production on the market while observing meat assessment in specialised units and expecting to be paid depending on the share of lean meat in the carcass and not depending on the live animal weight [2, 5, 6].

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2. Materials and methods
Research was carried out on commercial swine from a close circuit swine farm where we monitored some carcass and meat quality indicators depending on weight upon slaughter and animal age, in an attempt to find the optimum age for slaughter and to produce high quality meat.

3. Results and discussion
After producing the swine carcasses, we monitored the following indicators:
- meat water percentage;
- meat fat percentage;
- meat protein percentage;
- meat pH.

Analysing the data obtained, we can say that animals slaughtered when weighted 109 kg yield the highest quality meat, 21.88% proteins and 2.21% fats. It also contains the largest proportion of water, i.e. 74.66%, which makes it juicy and tender, and the value of its pH is absolute, i.e. 5.70%.

Finishing swine on family farms until weights above 109 kg results in changing the ratio between...
meat and fat detrimental to meat by increasing the fat layer on the animal’s back and by storing large amounts of fat on the muscle fiber; though this improves meat quality, it is very costly energetically which results in inefficiency of this management system (family farming), a subsistence farming system that allows only for the surplus to be marketed.

Swine have special biological and economic features and, if the biological material is taken from great producers of valuable genetic material, this domestic animal species yields 24-28 piglets per year due to its high, early prolificacy (they reach sexual maturity at the age of 6-7 months) and to its good adaptability to the environmental conditions, sometimes even precarious, due to its special resistance to diseases acquired over the millennia (diseases that result in serious damage in other animal species).

Swine valorise very well individual household resources and they also convert concentrated feed into meat with low specific costs, i.e. 2.7-3.2 kg for 1 kg of weight gain. During finishing, they gain an average 700-800 g daily; they gain an average 550-650 g during their entire life, turning feed resources economically into meat and fat depending on the goal of the breeder and on the quality of the feed supplied.

On family farms, swine are finished up to 135-140 kg of weight for meat, lard and ham. Due to the mutations in the human nutrition, animal fat consumption decreased for the benefit of vegetable fats; as a result, there has been a new trend in swine breeding for meat aiming at slaughtering the swine at lower weights to obtain carcasses with a lower proportion of fat and a higher share of meat.

Using for finishing on family farms valuable genetic material from specialised units to produce higher shares of proteins and lower shares of fat in the carcass results in lower slaughter weights and improved meat: fat ratio at a slaughter age of 8-10 months.

Knowing genetic and environmental factors that impact swine production on small family farms for meat self-consumption and for marketing, including weight and age upon slaughter, are of major importance for both genetic material producers and pork producers given that economically achieved high daily weight gains has a positive impact on the meat proportion in the carcass, on carcass quality and on the reduction of the fat proportion by reducing the finishing period [7, 8].

<table>
<thead>
<tr>
<th>Age of the swine (days)</th>
<th>Average weight (kg)</th>
<th>Water (%)</th>
<th>Protein (%)</th>
<th>Fat (%)</th>
<th>Ashes (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>109</td>
<td>74.66</td>
<td>21.88</td>
<td>2.21</td>
<td>1.25</td>
</tr>
<tr>
<td>210</td>
<td>115</td>
<td>74.65</td>
<td>21.75</td>
<td>2.32</td>
<td>1.28</td>
</tr>
<tr>
<td>220</td>
<td>122</td>
<td>74.60</td>
<td>21.68</td>
<td>2.68</td>
<td>1.30</td>
</tr>
<tr>
<td>230</td>
<td>133</td>
<td>74.52</td>
<td>21.08</td>
<td>3.10</td>
<td>1.30</td>
</tr>
<tr>
<td>240</td>
<td>144</td>
<td>74.40</td>
<td>21.00</td>
<td>3.30</td>
<td>1.31</td>
</tr>
</tbody>
</table>

Figure 1. Meat pH depending on age and slaughter weight
4. Conclusions

Research results point out the fact that the longer the swine age and the higher the animal weight upon slaughter, the worse the meat quality and the lesser the profitability of the farm; this allows us to draw the conclusion that, in order to get a good delivery price upon slaughter and an objective scoring of the carcass, small swine farmers (11000 swine heads slaughtered per year) should slaughter their swine at a weight of 115 kg when both economic results and meat quality are at their best.

References

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