

ON THE QUALITY OF CARCASS AND PORK IN SWINE EXPLOITED ON FAMILY FARMS

CALITATEA CARCASEI ȘI A CĂRNII SUINELOR EXPLOATATE ÎN FERMELE FAMILIALE

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Maximum values of dry matter and fat (% of the carcass weight) is achieved in swine exploited on small private family farms at 137 kg of dry matter and 115 kg of protein. Slaughtering swine at higher weight results in an increase of the dry matter and of the caloric value because of the increase of the amount of fat in the muscular fiber; thus, pork is of low quality because of the massive accumulation fat substance and the economic efficiency of producing pork is improper, with supplementary expenses on feed. Fattening swine on small family exploitations up to over 11 kg results in changes of the meat / fat ratio, detrimental to pork meat because of both thickening of lard on the animals' back and of fat depositions in the muscular fiber; though this improves pork quality, it is done with high expenses of energy, resulting in inefficient exploitation on private family farms that in most cases only supply for their families and rarely sell extra production.

Key words: family exploitation, swine, quality, carcass, pork

Introduction

Breeding swine is a tradition in Romania; swine valorise in optimal conditions the resources on private family exploitations of small size and supply the source of energy and protein in conditions of economic efficiency due to the advantageous price of feed (4, 5, and 9).

Swine have specific biological and economic features; if the biological material comes from large exploitations producing valuable genetic material, this species produces 24-28 piglets per year due to the high prolificacy and early precociousness (in 6-7 months they reach sexual maturity), to their good adaptability even to precarious environmental conditions, and to their particular

resistance to the diseases that result in considerable damage in other farm animals (3, 5).

Swine valorise very well resources on individual households, but they also have the particular feature of converting concentrated feed into meat with low specific expenses (2.7-3.2 kg of feed for 1 kg of weight gain). They achieve, during the fattening period, daily mean gains of 700-800 g, i.e. 550-650 kg during their entire growth, turning feed economically into meat and fat depending on the goal of the breeder and on the feed quality supplied during exploitation (6).

Meat obtained from swine is noticeable for its nutritious value due to the existence, in its chemical composition, of protein and fat that confer it particular features. It is noticeable through its taste and tenderness, and is very much demanded by consumers both fresh and preserved through different methods. Due to its low degree of hygroscopicity and high amount of fat, it is processed into a wide range of products with long shelf life and with qualities much appreciated by the consumers (1, 2, and 8).

On family households, swine are fattened until they reach 135-140 kg for meat, bacon, and ham. Because of the changes in human nutrition, animal fat consumption lowers while vegetal consumption grows; this resulted in a new trend in breeding swine for meat, which aims at slaughtering swine at lower weights in order to get carcasses with lower shares of fat and larger share of meat (7).

Using valuable genetic material (reaching high growth gains by storing large amounts of protein in the carcass detrimental to fat) from specialised units for fattening on family exploitations makes slaughtering weight diminish, meat / fat ratio improve, and slaughtering age go down to 8-10 months.

Material and Methods

Knowing genetic and environmental factors with an impact on swine exploited on small family farms for self-consumption and marketing, including slaughtering weight and age have a major importance for both genetic material producers and farmers because achieving daily mean weight gains in economically efficient conditions has a positive impact on the share of meat in the carcass and on the diminution of the fat percentage together with a shortening of the fattening period.

Studies were carried out on commercial pigs purchased from a unit specialised in producing genetic material; in pigs, we monitored some quality indices of the carcass and meat depending on slaughtering weight and age; we aimed at finding the optimal age for slaughtering on a subsistence farm, depending on animal age and weight. We determined water, fat, and protein percentage of the meat from swine slaughtered when weighing 115-135 kg, studying pH, dry matter, protein, fat, and mineral salt contents.

Results and Discussions

Obtaining quality carcasses with high percentage of meat is a major concern for breeders that wish to valorise their production surplus because present standards stipulate that meat assessment be done through objective methods and slaughtering be done in specialised units observing sanitary and veterinary standards; the payment also should be done depending on the percentage of lean meat in the carcass and not depending on the live weight of the animal (5, 6, and 7).

We slaughtered 35 commercial pigs of different age and weight, studying the impact of these parameters on meat quality. Results obtained are presented in Table 1.

Table 1

Pork quality depending on age and weight upon slaughtering

Age (days)	Mean weight (kg)	Number of pigs	Meat pH	Meat content (%)			
				Water	Protein	Fat	Ashes
207	115	8	5.70	74.66	21.88	2.21	1.25
217	120	7	5.72	74.65	21.75	2.32	1.28
229	125	7	5.75	74.60	21.42	2.68	1.30
242	130	6	5.75	74.52	21.08	3.10	1.30
255	135	7	5.80	74.40	21.00	3.30	1.31

We can see that animals slaughtered at 115 kg have high quality meat, the protein percentage being 21.88% while fat percentage is only 2.21%. Meat has the highest amount of water (74.66%), which gives it succulence and good tenderness, for an absolute pH of 5.70. Results obtained point out the fact that the more farmers increase age and weight of animals to be slaughtered, the lower the meat quality is and the more exploitation economic efficiency diminishes; the conclusion is that for small exploitations producing meat for self-consumption and surplus marketing it is better to slaughter pigs at 115 kg, when economic and quality results are best, price they can get is good, and carcass assessment is objective.

To also notice that, by increasing slaughtering weight over optimal weight, the animal's body changes from the point of view of the share of some components (dry matter, protein, and fat content) as does the energetic value of the meat (Table 2).

Table 2

Share of some components of the body depending on slaughtering age and weight

Live weight (kg)	Age (days)	Body components (%)		
		Dry matter	Protein	Fat
115	207	51.63	14.42	31.75

120	217	551.88	14.38	31.88
125	229	552.07	14.32	32.29
130	242	52.35	14.01	32.58
135	255	52.80	13.88	32.62

At the age of 207 and a mean weight of 115 kg, dry matter represents 51.63% compared to 52.80% when slaughtering weight is the highest. Though at 135 kg dry matter is at its best, meat quality is not the best because the amount of fat increases percentually detrimental to proteins and, to produce 1 kg of fat a pig consumes more resources compared to the production of protein, which results in higher expenses with the fattening until they reach such high weights.

Protein percentage has decreasing values with ageing and weight gain, but this component decreases in favour of the fat because at this age the animal has stopped growing. The optimal ratio is at the age of about 200 days, when the protein percentage reaches 14.42% and the fat percentage reaches 31.75%, and dry matter represents 51-52% of the animal body. The increase of the share of dry matter in the body results in no improvement of meat quality; it results in an increase of its energetic value through the higher share of the fat detrimental to protein storage, which needs high amounts of energy detrimental to economically efficient exploitation in the household system of fattening swine for self-consumption and surplus marketing.

Even if swine slaughtered at 115 kg supply traditional produce (particularly ham) at higher weights the quality of these produce has low quality compared to produce obtained when slaughtering animals at lower age and weight.

Conclusions

Two hundred days of age and a mean slaughtering weight of 115 kg in swine bred on private family farms that acquire the genetic material from specialised units are optimal to satisfy self-consumption needs and surplus marketing, when they reach the best feed conversion indices in meat meeting processing demands in traditional produce.

With ageing, fattening animals have increased dry matter and fat percentage due to body weight increase, but a decreased protein amount. High quality meat is obtained when animals are slaughtered at 115 kg when protein value is high and fat value is low.

Water percentage in meat diminishes with animal ageing and with weight gain, while pH increases depending on slaughtering age reaching 5.80 at a mean weight of 135 kg when dry matter amount also reaches 52.80%.

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