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THE EFFECT OF USING PIETRAIN BREED ON IMPROVING CARCASS QUALITY ON PIGS

Ilie ROTARU

The State Agrarian University of Moldova, 58, Mirceşti str., MD 2049, Chişinău, Republic of Moldova

Corresponding author email: i.rotaru@uasm.md

Abstract

The paper aimed the formation concerning the improvement of carcasses and pork meat. It includes the results of quality research on meat, carcasses and hybrids obtained by using Pietrain breed (white and white with black spots) – paternal form Yorkshire and Landrace maternal form. For this purpose, it was determined the carcasses length, thickness of fat on superior part, morphological structure of meat in carcasses. It was found significant difference between hybrids.

Key words: *meat, hybrids, breed, carcass.*

INTRODUCTION

The heterosis effect appears differently according to breed, quality of animals, their combination capacity and other conditions. To produce efficient hybrids there is necessary a good choice of breeds and lines with good combination capacities (Kosovac et al., 2009; Bozac et al., 2008).

The effect oh hybridization depends on nutriation and maintenance conditions, the reaction of organism to the environment and on the creation of every premises in order to achieve a prosper activity. Because the degree of heterosis manifestation concerning qualitative and quantitative characteristics varies, there appears the necessity of a good choice of breeds, to obtain qualitative production according to intended purpose. Nowadays there is not sufficient to produce meet without taking into account to consumers and processors needs (Birta, 2009; Cabanov, 2011).

Combination capacity of breeds in concrete amelioration conditions represents a decisive factor in production process of hybrids for the competitive meat.

Hybrids, being a product of hybridization are not a simple result of crossing, but animals with a rich heredity, which has special capacities of food assimilation and that through decrease of costs, produce more qualitative meat (Dragomirescu, 2007; Grosu and Oltenacu, 2005).

MATERIALS AND METHODS

Researches were made in pigs′ fattening enterprise SC″ West-Resurs″ SRL from the Republic of Moldova. Research material were swine hybrids, obtained from crossing Landrace breeds (maternal form) and Yorkshire (maternal form), white Pietrain and Spotted Pietrain. There were formed 3 experimental groups: I-Yorkshire x Landrace, II-Landrace x White Pietrain, III-Landrace x spotted Pietrain. Reproductive qualities of sows were appreciated by their prolificacy, lactation capacity and number of weaned piglets.

For fattening, there were used 48 young heads, each group having 16 heads. Animals were fattened until 100-120 kg, and then 8 individuals were sacrificed, from each category. The capacity of fattening was appreciated by reaching age, of 100 kg and average daily gain.

Carcasses were appreciated by their weight, length and ham development, determining the length of ham, thickness of lard at withers, spine, loin, croup.

RESULTS AND DISCUSSIONS

The action of genetic factors on animal production is determined by genotype influence, which was formed during selection process (breed, line, family etc.), genes interaction after mating and crossing breeds,

but also of genotypes with the environment. (Murugan et al., 2009).

In table 1, there are presented the results of reproductive quality appreciation of Yorkshire and Landrace sows with different paternal swine forms.

Table 1. The influence of combinative capacity of breeds on sows reproductive quality

Indicators	Groups		
	I Y x L	II L x PA	III L x PB
Prolificacy, head	10.6±0.10	9.9±0.20	9.4±0.20
Lactation capacity, kg	57.5± 0.28	52.1±1.03	47.4±1.60
Weight of piglets lot at 2 months, kg	183.8±1.80	170.4±3.4	160.4±4.3
Number of piglets at weaning, head	9.70±0.10	9.30±0.22	9.10±0.26

Data presented in table 1 reveals that a higher prolificacy was obtained in group number I of sows, and a smaller one in group number III, differences being of 1,2 piglets (B> 0.999) and between I group and III group-0,7 piglets (B> 0.99). Differences between I, II, III groups were insignificant, which proves that sows prolificacy staged by Pietrain boars decreased because of the influence of breeds at where paternal capacities are more developed.

The affirmation reflects upon lactation capacity, which was reduced in the experimental group III, with a difference towards group I equal with 10,1 kg. According to piglets lot weight of 2 months, there were noticed the same decreasing tendencies in group II and III. We must underline that Yorkshire and Landrace breeds, were used as maternal form, contribute to the maintenance of a good prolificacy through superior reproductive capacities and this is why, the number of piglets at furrowing varied from 9.49 and 10.6.

Increase results and development of young pigs obtained from the combination of different genotypes are presented in table 2.

Table 2. Growth speed of young hybrid pigs

Group	Breed combinations	The age of reaching 100 kg, days	Average daily gain from birth until finishing, kg
I	Y x L	211±1.8	542±3.6
II	L x PA	201±1.4	569±6.3
III	L x PB	206±1.6	554±4.1

The results of growth rate appreciation confirm that young experimental pigs prove a moderated growth and, the age of reaching 100 kg was over 200 days, in every pigs group. At the same time, a better result was obtained in group II, where crossing was used on Landrace breed (maternal form) and Pietrain (paternal form). Differences on average daily gain were equal with group I and II, with 27 g, and III with 15 g, being insignificant.

The study of formation capacity of meat production proved that pigs genotype influenced the quality of carcasses. There was identified that the carcass with a bigger length had crossing descendants of Yorkshire and Landrace breed, while their descendents obtained through Landrace and spotted Pietrain, characterized a smaller length. Descendants from group II were on intermediary position, but their carcasses were longer, comparatively with experimental group III at 100 kg category. These differences are less pronounced but significant.

Data concerning quality appreciation of carcasses are presented in table 3.

Table 3. Quality of carcasses at young hybrid pigs

Indicators	Groups		
	I (Y x L)	II (L x PA)	II (L x PB)
100 kg			
Carcass weight, kg	74.0±0.01	77.3±1.93	81.0±0.25
Length of carcass, cm	97.5±0.60	93.4±0.15	90.4±0.25
Ham length, cm	51.0±0.67	51.0±0.90	53.8±0.50
Ham perimeter, cm	71.4±0.87	70.2±1.15	74.4±0.72
120 kg			
Carcass weight, kg	88.2±0.13	92.7±0.85	96.2±0.32
Length of carcass, cm	99.7±0.70	93.3±0.25	92.9±0.73
Ham length, cm	53.8±0.54	54.2±0.93	56.8±0.30
Ham perimeter, cm	76.8±0.18	73.3±0.81	79.2±0.30

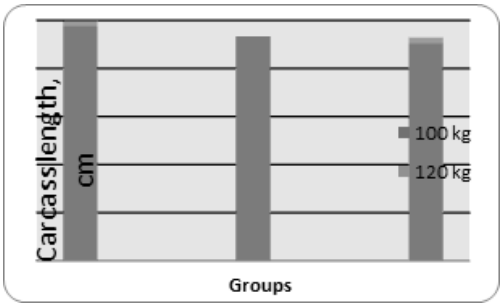

Figure 1. The carcass length in dependence of genotype and body weight

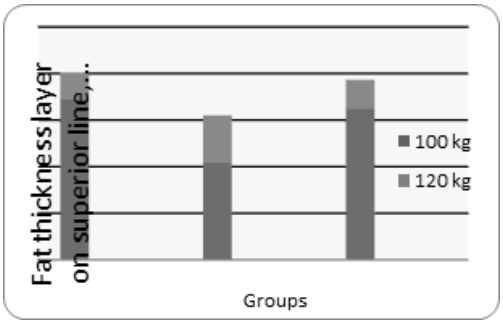

Figure 2. The fat thickness layer on superior line in dependence of genotype and body weight

The quality of carcasses at 100 and 120 kg, depends on pigs genotype and weight at slaughtering (table 3). Carcass mass on young pigs at group III, comparatively with group II at 100 kg was higher with 3.75 kg or 4.6% with 7.9 kg or 8.6% comparatively with group I. Carcasses length varied from experimental groups at 100 kg from 90.4 cm until 97.58 cm, and from 92.9 cm until 99.7 cm at 120 kg. There were registered significant differences between group I and II, I and III which were 4.1 and 7.1 m (B> 0.999).

Meat proportion on carcass is influenced by the level of development on ham, region which provides an important quality of lean meat. Ham length on group III was comparatively higher on group I and II with 2.8 cm at 100 kg and 2.6-3.0 cm at 120 kg. Globular ham were formed on young swine from group III, their perimeter exceeded group I and II with 3-4.2, cm at 100 kg and 1.9-2.4 cm at 120 kg.

The evolution of fat thickness in growth period is presented in table 4.

Table 4. The evolution of fat thickness layer on superior line at carcasses, mm

Carcass region	Groups		
	I (Y x L)	II (L x PA)	III (L x PB)
100 kg			
Wither	28.0±0.95	18.4±1.13	23.3±0.72
Spine	17.2±1.15	10.4±1.06	16.2±0.67
Loin	21.7±1.76	17.9±1.36	21.3±1.06
120 kg			
Wither	30.2±0.80	20.8±1.17	25.1±1.09
Spine	20.1±1.31	15.5±1.13	19.3±0.89
Loin	23.7±1.30	21.3±1.06	22.2±172

Fat layer formation in growth and fattening periods until 100-120 kg went differently, obtaining results which significantly depended on pigs genotypes. In every experimental group, regardless of breed membership or breed combination, there was registered a growth of fat layer thickness together with the increase of weight. The thickness of fat layer at pigs wither from group I equaled with 28.0 mm, being higher than in group III, with 4.8 mm or 17.1% (B> 0.95) and 9.6 mm comparatively with experimental group II (B> 0.999). We must mention that fat layer was thinner than the superior line of carcasses at every genotypes, but a smaller value was noticed at young pigs from group II, obtained by crossing Landrace and white Pietrain breeds. At spine region, fat layer was the thinnest, but differences varied from 6.8 mm (I and II), and 5.8 (II and III) (B> 0,999). In loin region, differences between groups concerning fat thickness were reduced, but it varied from 3.4 and 3.8 mm, between l groups I and II, II and III (B> 0.99).

CONCLUSIONS

1. Reproductive and fattening capacities, but also quality of carcasses is influenced by animal genotype, used at commercial swine hybrid production.
2. Using Pietrain breed boar at crossing, contributed to hybrid production, which formed qualitative carcasses, but this carcasses were longer and with a thinner fat layer, and were obtained from descendants as Landrace x white Pietrain, and globular hams with a bigger length realized Landrace x spotted black Pietrain hybrids.

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