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PRODUCTIVE PERFORMANCES OF HYBRIDS DEPENDING ON GENOTYPES OF MATERNAL AND PATERNAL FORMS OF SWINE

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Abstract

In this paper there are presented the results of hybrids appreciation obtained by combining Large White mixed production, Landrace breeds maternal forms and Pietrain, Hampshire – paternal forms. It was proven that for the formation of qualitative carcasses it would be rational to use tri-racial hybrids LA x L x P in production units, which are characterized by globular hams and an intensive development of main muscles that are qualitative meat providers.

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

INTRODUCTION

The creation of hybrids and swine cross requires the improvement of breeds genetic potential, types and parental lines.

For the selection of advanced hybrid, the appreciation of combinative capacity of genotypes on hybridization is needed.

The combination of different genes provides the modification of heredity, the growth of vitality, prolificacy and increase of swine meat production by using every genetic possibility such as the selection effect, the crossbreeding and heterosis.

The implementation of hybridization on swine depends on the results of swine selection, the amount of breeds and lines controlled by the combinative capacity and scientific provision of this amelioration method.

It is important to do researches concerning the production of qualitative meat which corresponds with the consumers preferences. In such conditions the quality of carcasses had a direct influence on the quantity and quality of products which should be prepared.

MATERIALS AND METHODS

The research was done at the abattoir “FARM MEAT CENTRU” from Bardar, using biologic material obtained in production units FARM MEAT PROCESSING.

In order to make this study there were formed 4 lots of hybrid obtained from the combination of Large White, Landrace, Hampshire and Pietrain breed which were exposed to fattening until 120 kg (Table 1). From each lot there were sacrificed 6 hybrids of swine.

Table 1. Research scheme

Lot	Parental forms		Animal weight at slaughter, kg	Number of animals
	Maternal	Paternal		
I	Large White	Large White	119.5	14
II	Landrace×Hampshire	Pietrain	120.3	14
III	Large White×Landrace	Hampshire	119.8	14
IV	Large White×Landrace	Pietrain	120.6	14

The carcass weight was determined by their weighing after slaughter, using electronic scale. The length of carcasses was measured with a ribbon, starting with the first cervical vertebra until the pectin. The width of carcasses on the exterior was determined on sixth vertebra, using ribbon, and on the interior on the chest part towards the thoracic vertebras.

The thickness of fat layer was measured with a ruler on thoracic vertebra 6-7, back, chest, croup, abdomen and flank.

The flitch was marked off between the last and penult lumbar vertebra and hocks, and then using electronic scale the weigh was determined.

Long dorsal muscle and the sirloin were prepared according to existing requirements. The results obtained were processed statistically (Bucataru, 1993).

RESULTS AND DISCUSSIONS

As a result of using different swine breeds for the production of hybrids there comes the necessity to determine general combinative and specific capacity. This is why, based on the results obtained there could be recommended different combinations of breed and lines for the obtaining of products requested by the consumer.

The quality of carcasses on swine depends particularly on their length and thickness on the interior and exterior. The longer the carcass will be, the more it will contain lean meat.

The width of carcasses indicates the rate of fat formation on superior and inferior line. The carcasses with a bigger width indicate a bigger amount of fat. (Table 2)

Table 2. The genotype influence on swine carcass quality

Lot	N	Genotype	Carcass weight, kg	Carcass length, cm	Carcass width on exterior, cm	Carcass width on interior, cm
I (control)	6	MAxMA	80.50±0.74	95.27±0.49	38.31±0.87	22.61±0.58
II	6	L×H×P	81.24±0.78	95.51±1.06	35.44±0.94	18.32±0.43
III	6	MA×L×H	82.21±0.96	97.52±0.34	37.80±0.63	20.14±0.66
IV	6	MA×L×P	83.22±0.68	97.41±0.54	34.64±0.79	19.55±0.78

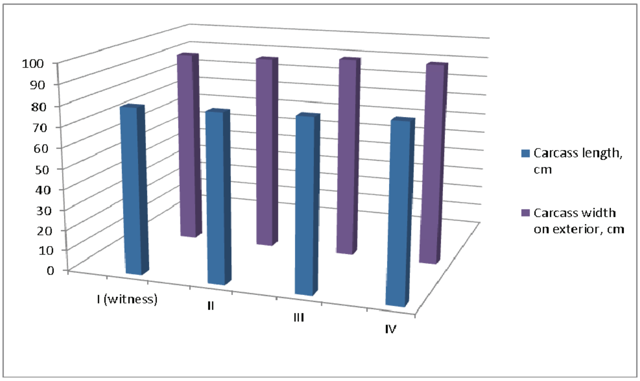

Figure 1. The length and width of carcasses depending on animals genotype

Dates presented in the table prove that carcasses with a length over 97 cm were obtained from III and IV lot, where the maternal form were biracial sows MA x L. The difference between lot III, IV and I was equal with 2.25 cm, 2.14 cm (B≥0.95). In these lots there were obtained 2.72 kg, 1.71 kg heavier carcasses (B≥0.95).

The width of carcasses on the exterior in lots where there were used terminal boar of Pietrain breed was equal with 34.64-35.44 cm, and the difference represents 2.87 -3.67 cm (lots II and IV) (B≥0.95).

Such tendencies were identified by observing the thickness of carcasses on the interior. Comparative differences with control lot were equal with 4.29 and 2.06 cm. These results prove that the layer of fat on swine from these lots was thinner in different parts of carcasses (Table 3).

The thickness of fat layer in towards 6-7 thoracic vertebra was significantly lower in lots II and IV with 10.0 and 11.1 mm (B≥0.999) which confirms the fact that hybridization influences positively the carcass quality.

Such differences were registered in the back part, where there were equal with 13.9 and 8.1 mm (B≥0.999).

Table 3. The thickness of fat layer depending on swine genotype

Lot	N	Genotype	The thickness of fat layer, mm			
			6-7 thoracic vertebras	Back	Chest	Croup
I (control)	6	MAxMA	37.8±0.49	32.6±0.65	26.5±0.70	24.4±0.51
II	6	L×H×P	26.4±0.91	18.7±1.01	15.4±1.4	18.5±0.85
III	6	MA×L×H	30.5±0.67	29.3±1.14	20.8±1.25	22.6±1.3
IV	6	MA×L×P	27.8±0.87	24.5±0.94	19.2±1.09	21.0±0.89

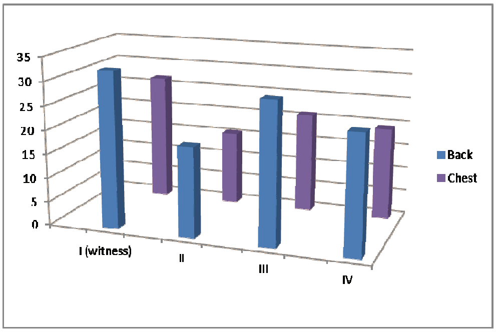

Figure 2. The influence of genotype on the fat thickness on spine and loin

Here, the fat layer was thinner in lot II, equal with 18.7 mm when the obtaining of hybrids was used only in specialized breed for the meat production such as Landrace, Hampshire, Pietrain.

In the chest part, the fat layer varied in experimental lots between 15.4 and 20.8 mm in lot III of young swine. Differences were 11.1 and 5.7 mm (B≥0,999).

The quantity of meat from carcass is influenced by the degree of ham development, long dorsal muscle and sirloin (Table 4)

Table 4. Genotype influence on ham development, long dorsal muscle and sirloin

Lot	Genotype	N	Weight, kg		
			Ham	Long dorsal muscle	Sirloin
I (control)	MAxMA	6	9.20±0.68	1.55±0.06	0.348±0.08
II	L×H×P	6	12.31±0.41	2.49±0.11	0.666±0.06
III	MA×L×H	6	10.52±0.52	1.96±0.16	0.440±0.09
IV	MA×L×P	6	11.24±0.65	2.31±0.22	0.580±0.12

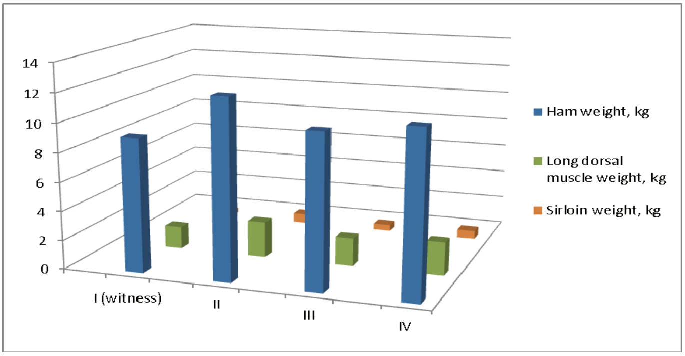

Figure 3. The weight of ham, long dorsal muscle and sirloin

The genotype of animals influences the degree of development of principal muscles from carcass and ham, their weight being equal with lots II, III and IV with 10.52-12.31 kg. The differences between lot being insignificant in comparison with lot I, being 1.32 and 2.04 lot III-IV, 3.11 kg (lot II) (B≥0.95).

The weight of lung dorsal muscle in these lot was of 1.96-2.49 kg, the differences in comparison with control lot (Large White) reached limits between 0.41-0.94 kg. Sirloin reached values that vary in lots II, III and IV from 0.440 to 0.666 kg, increasing compared to witness lot with 0.092 kg-0.318 kg, results which formed these differences from genotypes (B≥0.95).

Qualitative meat quantity formed in carcass depends on the development of ham according to length and perimeter (Table 5).

Table 5. The development of ham and thickness of inferior line carcasses

Lot	Genotype	Ham length, cm	Ham perimeter, cm	Fat thickness on inferior line, mm	
				Abdomen	Flank
I (control)	MAxMA	40.02±0.38	78.16±0.17	27.36±0.36	29.42±1.05
II	L×H×P	45.15±0.77	85.24±0.56	20.11±0.81	24.81±0.39
III	MA×L×H	42.4±0.85	83.18±0.64	23.58±0.95	27.15±0.58
IV	MA×L×P	44.12±0.37	84.42±0.77	21.23±0.40	25.66±0.96

The results obtained according to dimensional measurements, prove that ham with a bigger length, which varies from 42.4-45.15 cm were accomplished by experimental lot hybrids. The best dates were obtained in young swine lot II, where the length of ham was equal with 45.15 or with 5.13 cm (B≥0.999) bigger in control lot (I). The carcasses in lot IV where characterized by a higher length of ham, with 4.10 cm (B≥0.999). We can conclude that in these lots, hams were globular and in the result, their perimeter reached 83-85 cm, the difference in comparison with lot I was equal with 7.08 (lot II) (B≥0.999 and 6.16 (lot IV) (B≥0.999). The quantity of fat from carcasses depend on the fat layer formed on the inferior line, especially in the abdomen are and flank.

The dates presented in Table 5 prove that fat layer in this areas exceeded 20 mm in all lots, but hybrids from lot III formed a fat layer in abdomen area with 7.25 mm (B≥0.999) thinner, in comparison with control lot. On flank, the difference was equal with 4.61 mm (B≥0.999), and in lot IV with 3.76 mm (B≥0.999).

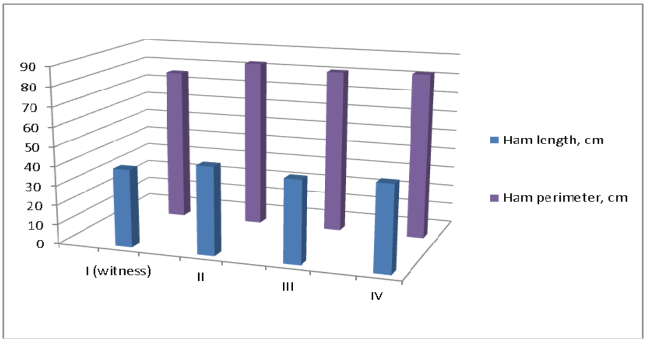

Figure 4. The length and perimeter of ham on swine hybrids

CONCLUSIONS

1. The capacity of combining breeds which influence the degree of development of carcasses, hams and main muscles. The weight of long dorsal muscle in II and IV lots was of 0.94 kg and 0.76 kg heavier (B≥0.95) in comparison with lot I. The weight of sirloin was proved by values, which difer depending on animals genotype, formed by crossing mixt breeds and specialised on meat production.
2. The thickness of fat layer on 6-7 torachic vertebra was less in II and IV lot and 11.4 mm (B≥0.99) than in control lot. On the back part, the differences were equal with 13.9 and 8.7 mm (B≥0.999). This confirms that hybridization influences positively the quality of carcasses and contributes to the increase of superior quality meat amount.

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