# THE STUDY OF QUALITY ON SWINE ACCORDING TO TERMINAL BOAR RACE

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**Abstract**

*A review of recent swine crossbreeding experiments is presented and integrated with earlier work. Variation among experiments in observed heterosis for specific crosses was large for production of carcasses. There were experienced five variants of hybridization schemes using the breeds: Yorkshire, Landrace, Hampshire and Pietrain. The received results certify the receiving of some higher productivity indices of growing intensity at the type of Pietrain. The best quality of carcasses was observed on hybrids obtained from using of meat breeds of boars like Pietrain and Pietrain X Landrace.*

**Key words**: boars, breed, carcasses, genotype, hybrid

## INTRODUCTION

Animal crossing is a very useful tool for pork producers and namely, the efficient and profitable growth. To fully benefit from the results of hybridization we select and combine animals with the best productive and reproductive potential [1]. Hybridization is the main form of using modern breeds, over 90% of slaughtered swine in USA being hybrid pigs. This is due to the fact that hybridization determines the increase of animals' productivity through exploitation of complementarities between breeds and the use of heterosis phenomenon [2].

On crossing two breeds, the heterosis effect is defined as the difference in performance between cross pigs and the average of breeds participating or superior progeny derived by crossing compared to the average of participating breeds [3].

The choice of initial animals and best pairing will help obtaining hybrids of a superior value, corresponding to current requirements, based on genetic peculiarities. Following these references a comparative study is important in order to observe the carcass quality obtained through the participation of breeds as Yorkshire, Hampshire, Landrace and Pietrain.

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## MATERIAL AND METHODS

The experiment has been made on pigs breeding and fattening unit Vergecom, Hincesti, Republic of Moldova**.** To obtain hybrids, as maternal form, there have been used Yorkshire sows, and the paternal form constituted Hampshire, Landrace, Pietrain breed boars and Landrace, Pietrain biracial boars. For obtaining experimental biologic materials there were formed five batches of pigs, according to the scheme presented in Tab. 1.

During gestation, sows were maintained and fed in analogue conditions, by all the rules in force, using full value mixed fodder, which assured the necessities of nutrients.

To study the growth capacity and the specific consumption by the analogue principle there were selected 90 heads of young piglets and there were formed five experimental batches taking into account the origin, age and weight.

After weaning, pigs were weighted and placed in a shelter with suspended boxes, and marked in order to know their provenience and to make experimental works. During their growth there were created maintenance analogue conditions and feeding conditions.

Fodder distribution was made 3 times a day, until reaching the weight of 50 kg, then twice a day until fattening period, water provision being modest. After accumulating weight, young pigs were transferred in fattening halls, each head being awarded to 1.33 $m^2$, of floor area, 18-20ºC, humidity of 65-70%.

Table 1 Scheme of the experiment

| Batch | Parental forms Maternal | Paternal | Result Sows | Weight gain |
|---|---|---|---|---|
| I | Yorkshire | Yorkshire | 6 | 15 |
| II | Yorkshire | Landrace | 6 | 15 |
| III | Yorkshire | Hampshire | 6 | 15 |
| IV | Yorkshire | Landrace X Pietrain | 6 | 15 |
| V | Yorkshire | Pietrain | 6 | 15 |

The foddering recipe was made of 35 % corn, 35 % barley, 10% soy grits, 10% grain, 4 meat-bone meal, 3% bran, 1.5% chalk feed, 1% premix, 0.5% salt. After slaughtering, there was determined the slaughter mass (carcasses with heads, states and internal fat), carcass weight and slaughter yield.

The big length of carcasses determined through length measurement of the first cervical vertebra until the front side of the pubis bone and the small length from anterior part of the first thigh till the pubis bone, the length of ham till hocks and the perimeter in the most globules place.

## RESULTS AND DISCUSSIONS

Based on analogue conditions of feeding and maintenance, the capacity of growth and development of pigs' carcasses was manifested differently. Concerning the development of carcasses, between experimental batches, there were established significant differences (Tab. 2).

Table 2 Results of piglings' slaughter

| Batch | n | Live mass at slaughter, kg | Slaughter mass | Carcass mass | Slaughter yield,% |
|---|---|---|---|---|---|
| I | 4 | 114 | 86.26±2.04 | 73.43±0.26 | 75.14±0.36 |
| II | 4 | 116 | 88.60±1.82 | 74.47±0.22 | 76.11±0.30 |
| III | 5 | 115 | 86.98±1.91 | 75.90±0.50 | 75.11±0.65 |
| IV | 5 | 114 | 88.82±1.34 | 76.30±0.25** | 77.59±0.31** |
| V | 6 | 116 | 90.24±1.52** | 78.94±0.28*** | 77.69±0.05** |

**(B>0.99). ***( B>0.999 )

The results presented in the table prove a specific growth of hybrids. influenced largely by the participating parental forms obtained. Carcasses with a bigger weight were obtained from V experimental batch from Yorkshire x Pietrain breeds. Slaughter masses of carcasses reaches the value of 90.24 kg and the carcass weight an average of 74.94 kg.

Significant differences were reported between V and I batch of 3.98 kg and 5.51 kg at carcass weight B>0.99 and B>0.999. A higher yield at slaughter were noticed at carcasses obtained by using Pietrain breed from IV and V batches of 77.59% and respectively 77.69% with significant differences towards I lot of approximately 2.5%. B>0.99.

Meat production depends mostly on the carcass length and the degree of development of ham.

Table 3 Carcass length and ham development at swine

| Lots | Carcass length | Ham mass.kg | Ham length | Perimeter |
|---|---|---|---|---|
| I | 99.1±2.16 | 10.11±0.06 | 38.37±0.6 | 65.11±0.8 |
| II | 106.7±2.07* | 11.15±0.18 | 41.82±0.7 | 73.52±1.1 |
| III | 101.1±1.93 | 10.84±0.12 | 41.38±0.5 | 75.19±0.9 |
| IV | 105.9±2.21 | 11.58±0.24 | 43.74±0.5* | 77.92±0.7 |
| V | 103.7±1.89 | 11.72±0.08 | 43.61±0.3** | 81.05±0.5** |

* (B>0.95 ). **(B>0.99)

The longest carcasses were obtained in II batch being equal with 106.7 cm. which can be explained by the influence of Landrace breed that is characterized by an elongated body with well developed hams. The significant difference was of 7.6 cm in comparison with Yorkshire breed. Good results (105.9 cm) were obtained in IV batch there were used terminal biracial boars for Landrace x Pietrain reproduction.

Data from the table confirms the fact developed hams were obtained from swine of IV and V batches having indices almost equivalent from 43.76-43.61 cm length and 77.92-81.05 cm in perimeter. Significant differences were obtained by ham perimeter which constituted between V and I batches of 15.9 cm (B>0.99) which explains the formation of globular hams by using Pietrain boar. The results of the carcass appreciation on fat layer are presented in Tab. 4.

Table 4 Thickness of bacon on superior and inferior line of carcasses

| Lot | I | II | III | IV | V |
|---|---|---|---|---|---|
| 6-7 vertebra | 32.7±0.7 | 27.2±0.5 | 26.8±0.5 | 25.4±0.3 | 24.3±0.3 |
| back | 29.7±0.5 | 21.5±0.3 | 20.8±0.2 | 20.1±0.3 | 18.8±0.3** |
| loin | 27.2±0.5 | 24.1±0.3 | 19.4±0.3 | 18.2±0.2 | 17.1±0.2** |
| croup | 24.9±0.4 | 17.3±0.2 | 17.4±0.3 | 16.8±0.3 | 15.5±0.2 |
| chest | 18.3±0.3 | 17.1±0.3 | 16.6±0.3 | 14.8±0.2 | 11.6±0.2 |
| abdomen | 25.1±0.5 | 23.2±0.4 | 21.8±0.5 | 20.6±0.4 | 18.6±0.3 |

**(B>0.99)

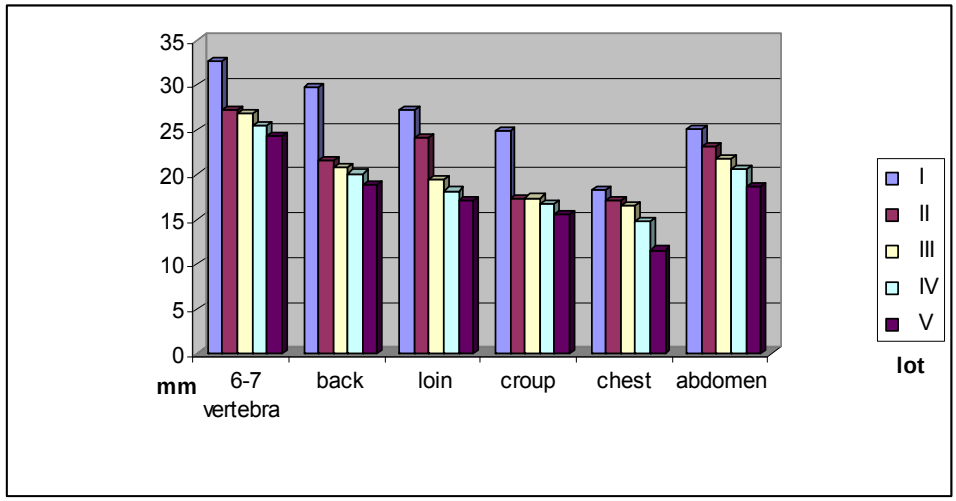


Fig. 1 Thickness of bacon on superior and inferior line of carcasses

Data presented in the table prove that thickness of bacon is different. on its value that influences directly the genotype of young swine. In this way hybrid from V batch obtained by crossing Pietrain boar with Yorkshire sows. was obtained the thinnest layer of bacon in every region of the body. Fat quantity accumulated in carcass is influenced in a specific manner by the layer of bacon formed on inferior line of carcasses. It is important that in this region the bacon must be thin. this influences the quality of carcasses and their commercial aspect.

Bigger differences were noticed on V and batches on 6-7 vertebra- 8.4 mm. 9.4 mm croup back and loin of 10.9 mm and 10.1 mm (B>0.99).

## CONCLUSIONS

The growth energy and productive qualities of hybrids were influenced largely

by the genotype of animals used for swine crossing and hybridization.

The dimensional appreciations of carcasses confirm that carcasses with a bigger length were obtained in II and IV batches of hybrids were between the values 105.9-106.7. Significant differences were noticed in I and II batches of 7.6 cm (B>0.95). Hams presented a higher perimeter and the index was 81.05 cm followed by IV lot with 77.92 cm.

Carcasses with a thinner layer in most body regions were seen in swine from V batch followed by IV batch at differences of 2-3 mm. Significant differences were materialized between V and I batches constituting on 6-7 vertebra-8.4 mm. 9.4 croup back and loin of 10.9 mm and 10.1 mm (B>0.99).

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