

## THE COMPARATIVE STUDIES OF QUALITY OF CARCASS AND MEAT OF COMMERCIAL HYBRIDS OF PIGS

### CERCETĂRI COMPARATIVE PRIVIND CALITATEA CARCASELOR ȘI A CĂRNII LA HIBRIZII COMERCIALI DE SUINE

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*In the paper are presented the results of a comparative research of meat and carcass quality at the hybrids obtained by using final boars specialized in meat production. A difference was established concerning the hybrid's productive capacity as well as the efficiency of using the genetic types of boars for quality production of carcass and competitive meat.*

**Key words:** breed, boars, hybrids, meat, gain

#### Introduction

Growing pigs and their meat production has an old tradition in Republic of Moldova. It is determined by the population's choice for this kind of meat which is in the first place in sort consumption, the position which will be stable longtime forward. It is influence also by the fact that agriculture is the majority in the sphere of job population and so disposes a large variety of fodder resources necessary for animal feeding.

Future farms and units of pig's growing and fattening will not be able to function and to be competitive than through practicing the intensive system which doesn't depend on the digital capacity of growth, but on practicing the selection and hybridizing technology, on feeding and exploiting, modern and efficient. [1; 3; 4; 5]

The use of these technologies must assure the continuing growth of the meat and carcass quality by the permanent decrease of fodder consumption and force labor.

The performance and competition in obtaining the commercial meat production cannot be profitable unless producing, growing and fattening commercial hybrids triple breed and quadribreed by using in breeding schemes the most productive breeds, lines and types of pigs well acclimatized and selected in our conditions.

The purpose of these researches was to study the carcass and meat quality at the hybrid pigs resulted from different crossings with imported breeds like Yorkshire and Landrace

## **Materials and Methods**

The researches have been made in J.S.C Marculesti Combi, Republic of Moldova. To study the carcass and meat quality at the hybrid pigs four experimental animal lots have been formed. They were selected by the origin, age and weight principal. The first lot was formed by crossing breeds like Large White and Landrace; the second lot – Large White × Hampshire; the third lot – meat type “Southern” × Hampshire × Yorkshire; the fourth lot – meat type” Southern” × Hampshire × Landrace. The similar feeding and keeping conditions were made for growing and fattening process. The young pigs were placed in suspended boxes above the soil, but for the feeding was used mixed fodder especially for growing and fattening and also was added 1.5 kg skim milk for each animal. In the experiment were used 48 live stocks, for 12 in each lot. For every slaughter were used 3 hybrid pigs from each lot. The fattening was till the weight of 100 kg. The carcass quality was appreciated by the European standards. Different measurements have been made: the long and short carcass length, the external and internal width, the ham’s length and perimeter. The thickness of the fat layer has been measured from the withers, back to loin.

The researches concerning the meat quality have been made from the samples of the long dorsal muscle taken from the lumbar region. In 24 hour after slaughter the samples were analyzed by a standard method in order to determine the water, protein, fat and ash content. To determine the acidity level a PH meter has been used.

## **Results and Discussions**

The meat and carcass quality is influenced by the pigs genotype. It is more efficient if at the meat production are used hybrids, because they are carcaterized by a growing energy net superior to animals with pure breed and good capacities to produce a qualitative carcass. [4; 5]

The daily average live weight gain evolution is presented in table 1.

Table 1

The daily average live weight gain evolution, g (n=12)

| Lot | The age period ,months |        |        |        |
|-----|------------------------|--------|--------|--------|
|     | 3-4                    | 4-5    | 5-6    | 6-7    |
| I   | 486±14                 | 570±18 | 630±10 | 666±19 |
| II  | 450±16                 | 576±19 | 623±15 | 673±14 |
| III | 513±11                 | 563±12 | 653±12 | 663±9  |
| IV  | 490±17                 | 566±9  | 686±8  | 691±13 |

The results presented in the table point out that simultaneously with the age increase the daily average live weight gain increases in all experimental lots. A more intensive growth was observed between the age of 3 to 6 months and after this age the daily average live weight gain increased with a less value weight. In the period of growing from three to four months an increase in weight was obtained in lot III where the paternal form consisted in Yorkshire breed. The difference between the lots III and II equalized with 63g. ( $P \leq 0,1$ )

Starting with the age of five months the young pigs from the lot IV presented a higher speed in growing and as a result the daily average live weight gain increased till 690g, and the difference was 27g, in comparison with the young pigs from the lot III.

A bigger difference between these lots was observed between the age of 5 and 6 months and was 33g. ( $P \leq 0,05$ )

At the end of the fattening period a control slaughter has been made and the results are presented in table 2.

Table 2

The carcass appreciation results at the young pigs after the dimensional index (n=3)

| Lot | The long length of the carcass | The small length of the carcass | Anterior width |           |
|-----|--------------------------------|---------------------------------|----------------|-----------|
|     |                                |                                 | external       | internal  |
| I   | 105.1±0.30                     | 87.4±0.21                       | 39.2±0.18      | 19.5±0.19 |
| II  | 97.4±0.53                      | 87.0±0.30                       | 32.1±0.30      | 17.6±0.12 |
| III | 98.3±0.62                      | 85.6±0.25                       | 36.3±0.17      | 17.3±0.14 |
| IV  | 99.1±0.66                      | 86.1±0.33                       | 35.4±0.25      | 18.5±0.14 |

The results show that hybrid pigs, obtained by participating of different genotypes, have produced carcasses that differ in length and width. A longer carcass was observed at the hybrids where the paternal form was the breed Landrace. The carcass's length in the first lot equalized with 105 cm, but the difference between the I and II lot was 8cm, I and IV - 6 cm, I-III - 7 cm ( $P < 0,001$ ). The carcass width influences the meat and fat production. The results

presented in the table confirm the fact that a bigger carcass width was at the young pigs from the I lot with 39 cm or with 3 cm bigger than the lot II and with 3 - 4 cm in comparison with the lot III-IV ( $P \leq 0,001$ ). The hybrids obtained with the breed Landrace have developed better in the middle part of the body. As a result the small length in the lot III-IV was 84-87cm, but the differences in comparison with the lot II-IV equalized with 2cm ( $P \leq 0,01$ ). The experimental facts prove that producing hybrids by using the breed Landrace will contribute to a good bacon production .

The carcass quality depends on the fat layer at the superior line, but its uniformity has a significant importance for the commercial aspect. [1; 3; 5]

The fat layer measurement are presented in table 3.

Table 3

The thickness of the fat layer in different parts of the carcass, mm (n=3)

| Lot | Carcass region |                       |           |           |
|-----|----------------|-----------------------|-----------|-----------|
|     | Withers        | Thoracic vertebra 6-7 | back      | loin      |
| I   | 35.2±0.71      | 28.6±0.91             | 24.2±0.48 | 22.4±0.49 |
| II  | 34.4±0.60      | 26.5±0.80             | 22.3±0.63 | 21.3±0.53 |
| III | 28.1±0.66      | 22.4±0.45             | 18.5±0.73 | 17.2±0.61 |
| IV  | 29.6±0.94      | 20.7±0.51             | 19.2±0.68 | 18.6±0.48 |

The information presented in the table confirms the facts that a thinner and uniformly distributed fat layer has been obtained in the lots. where the Hampshire and Yorkshire breeds have been used. The thickness of the fat layer in the region of thoracic vertebra 6-7 was in the lot I-II equalized with 26-28 mm, in lots III-IV 20-22 mm. The differences are in 4-8 m ( $P \leq 0,001$ ). In these experimental lots the fat layer is more uniformly distributed and can be observed a slight decrease from the withers to the loins. In the experimental lots where the maternal form was the Large White was distinguished a significant difference in the thickness of the fat layer at withers level, vertebra 6-7, back and loin.

The results of ham development at the young hybrid are presented in table 4.

Table 4

Ham characteristics at the hybrid pigs (n=3)

| Lot | Weight,kg | Length,cm | Perimeter,cm |
|-----|-----------|-----------|--------------|
| I   | 10.6±0.15 | 42.2±0.49 | 71.2±1.31    |
| II  | 10.2±0.11 | 41.3±0.55 | 69.4±0.48    |
| III | 11.2±0.06 | 46.3±0.26 | 71.3±1.23    |
| IV  | 10.9±0.17 | 45.2±0.62 | 72.9±0.52    |

The results in the table show that the degree of ham development, in weight, length and perimeter at the commercial hybrids is different, and a bigger

weight has been recorded at the commercial hybrid, where the maternal form was breed Hampshire and the paternal form was Landrace. The differences between the lots III-I was 0,6kg, at the III-II was 1kg and at the III-IV was 0,3kg ( $P \leq 0,05$ ;  $P \leq 0,01$ ). More developed ham was obtained at the lot III, where the perimeter was 72 cm and the length 46 cm. The similar results have been recorded at lot IV. The meat production is determined by the carcass quality and as well by the meat quality. To determine the meat quality we need to analyze the chemical composition and physic properties.

The results of the chemical composition and physic properties are presented in table 5.

Table 5

Chemical composition and physics properties at the pork meat  
(The long dorsal muscle)

| Lot | Chemical composition |         |      |      | PH   | The capacity of water retention, % |
|-----|----------------------|---------|------|------|------|------------------------------------|
|     | water                | protein | fat  | ash  |      |                                    |
| I   | 71,71                | 22,05   | 5,03 | 1,1  | 5,58 | 43,9                               |
| II  | 71,05                | 22,37   | 5,33 | 1,03 | 5,59 | 43,8                               |
| III | 70,54                | 23,51   | 5,02 | 0,93 | 5,62 | 43,3                               |
| IV  | 70,39                | 23,42   | 5,28 | 0,90 | 5,65 | 42,8                               |

The facts in the table point out that the differences in water content in the lots of hybrids are not significant and equalized with 70-71%. The protein content in meat was 22-23%; a higher level was at the lots III-IV. In fat content big differences have not been recorded varying from 5,02 to 5,28. The meat acidity defines the degree of intensity of the biochemical processes, which can be observed after the slaughter. The meat PH at the different hybrids equalized with 5,58-5,65, which confirm a good quality concerning the chemical, physics and technological properties.

### Conclusions

The growth intensity, the carcass and meat quality are influenced by the pig genotype, as well as by breed form (maternal or paternal) used for crossing in order to produce commercial hybrids. Using the breeds as Landrace, Hampshire and Yorkshire to obtain the young pigs for fattening, contribute to the meat and carcass quality improvement. The chemical structure and the physics properties of the meat at all commercial hybrids are at the request level and no significant deviations at the water, fat content, PH level and the water retention capacity have been recorded.

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*În lucrare se prezintă rezultatele cercetărilor comparative a calității carcaselor și a cărnii la porcii hibridi obținuți prin utilizarea vierilor terminali, specializați în producția de carne. S-a stabilit diferența, privind capacitatea productivă a hibrizilor, precum și eficiența folosirii tipurilor genetice de vieri pentru producerea carcaselor de calitate și a cărnii competitive.*

**Cuvinte cheie:** rasă, vier hibrid, carne, spor.