

Influence of Genetic Type on the Quality of Pig Meat

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Abstract

Aspects commonly found in the literature on meat quality of swine, shows the fact that, in a large number of qualitative peculiarities of muscle tissue, it can select the color and pH as some of the most important physical elements. These parameters are closely interdependent with biochemical processes that occur in the meat after slaughter. In this work, the research has been conducted on 40 samples, taken from the semimembranos muscles from breeds Large White, Landrace, Line S 345 Periş Duroc, Hampshire and Perhib, F1 hybrids (Large White x Landrace) x Pietrain and F1 (Large White x Landrace) x Seghers for the determination of dry matter content of fat, protein, and fat quality (where they analyzed the consistency and index of iodine). Methods used to analyze the parameters listed are those in the literature. Age of the animals on slaughter was 183-185 days. Protein content ranged between 20,36% and 21, 27%, the report water/protein between 3,38 and 3,63. High values of protein content present breeds Large White (21.4) Landrace (21,41), LSP 345 Periş (21.1/13.1), Hampshire (21,03), followed by the Duroc breed (20,72). Percentage value of Duroc breed is due to the higher fat content (6.00). Of hybrids, a lower value provided the combination F1 x Pietrain. As regards the percentage of fat, the values are within the limits 4,32-6.00, which provides realization of flavour, succulence and tender degree. It must be noted in this point of view the breed Duroc (6), followed by the Large White breed (5).

Keywords: genetic type, pig meat, quality

1. Introduction

Quality of pork meat is conditioned by many factors. Some of them act in the animal's life, others after killing it. Thus, race, sex, age, state of maintenance, etc., are decisive factors on meat quality, and nature, direction and speed of development of biochemical processes in muscle tissue after suppression of animal life, have an important role [1]. Factors influencing meat quality can be grouped into: farmed factors, genetic factors, factors related to preparing pigs for slaughter (transport, fasting, etc.) and factors

in the slaughterhouse [2]. Pig meat consumption presents a significant growth and at the same time establishes a growth of consumer preferences for a good quality, to satisfy the tastes of the refined and more of them and to ensure a healthy and balanced nutrition [3].

2. Materials and methods

In this work, the research has been conducted on 40 samples, taken from the semimembranos muscles from breeds Large White, Landrace, Line S 345 Periş Duroc, Hampshire and Perhib, F1 hybrids (Large White x Landrace) x Pietrain and F1 (Large White x Landrace) x Seghers for the

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determination of dry matter content of fat, protein, and fat quality (where were analyzed the consistency and index of iodine). Methods used to analyze the parameters listed are those in the literature. Age of the animals on slaughter was 183-185 days. Between obtained values for each analyzed biochemical indexes was applied Student test for notice the significance differences between breeds and hybrids.

3. Results and discussion

Data on protein and fat content reveals a protein content between 20.36% and 21.27%. Elevated protein content presents races Large White (21.40%), Landrace (21.41%), followed by LS 345 Peris breed (21.01%) and Hampshire breed (21.03%). Among hybrids, Perhib presents the highest content in protein (21.27%), followed by F1xSeghers (21.09%) and F1xPietrain (20.36%) (Table 1).

Table 1. Biochemical indexes of pig meat (semimembranos muscle)

Breed	U% $\bar{X} \pm S_x$	Protein% $\bar{X} \pm S_x$	Fat % $\bar{X} \pm S_x$
Large White	73.35±0.15	21.40±0.16	5.00±0.20
Landrace	73.21±0.36	21.41±0.47	4.32±0.09
Linia S 345 Peris	72.52±0.25	21.01±0.43	5.42±0.07
Duroc	72.33±0.16	20.72±0.27	6.00±0.03
Hampshire	73.45±0.20	21.03±0.41	4.50±0.12
Perhib	73.51±0.17	21.27±0.31	4.56±0.18
F ₁ xPietrain	73.91±0.16	20.36±0.29	4.49±0.21
F ₁ xSeghers	72.92±0.17	21.09±0.19	4.56±0.05

Student-test for significance differences test showed significant differences between the percentage of protein and LSP 345 Peris Large White and Hampshire breeds. Hybrids, there are significant differences in terms of

percentage of protein in F1 x Pietrain and the other two hybrids. Between hybrids and races, distinct differences appear significant between Large White, Landrace and hybrids F1 (Pietrain and Seghers) (Table 2).

Table 2. Student Test for Protein content (%)

Breed	Large White	Landrace	LSP 345	Duroc	Hampshire	Perhib	F1xPietrain	F1xSeghers
Large White	-	0.21 ^{NS}	2.02*	0.41 ^{NS}	2.54*	1.02 ^{NS}	3.41**	2.16*
Landrace		-	2.04*	0.45 ^{NS}	2.63*	1.06 ^{NS}	3.87**	2.26*
LS 345 Peris			-	1.65 ^{NS}	0.27 ^{NS}	1.08 ^{NS}	2.28*	0.43 ^{NS}
Duroc				-	0.87 ^{NS}	2.07*	2.62*	2.59*
Hampshire					-	0.94 ^{NS}	2.46*	0.34 ^{NS}
Perhib						-	3.45***	4.21***
F ₁ xPietrain							-	0.84 ^{NS}
F ₁ xSeghers								-

* $t_{78,0.05}=1.99$; ** $t_{78,0.01}=2.64$; *** $t_{78,0.001}=3.42$

The lower percentage of protein in the Duroc breed is due to higher fat content (6.00%). In terms of fat percentage, within the limits 4.32-6% values, values that ensure superior qualities of flavor, tenderness and succulence [4]. It's remarkable in this regard, Duroc breed with a fat percentage of 6%, followed by LSP 345 Peris

breed with a rate of 5.42% fat. Hybrids, percentage of fat values are comparable, no significant differences between them. The lowest percentage of fat it has Landrace breed (4.32%), followed by Hampshire breed (4.5%). In Table 3 presents the results of Student test for testing the hybrids in terms of body fat.

Table 3. Student Test for Fat content (%)

Breed	Large White	Landrace	LSP 345	Duroc	Hampshire	Perhib	F1xPietrain	F1xSeghers
Large White	-	2.13*	2.35*	2.79**	2.24*	2.17*	2.32*	2.10*
Landrace		-	2.68**	2.98**	1.84 ^{NS}	1.74 ^{NS}	0.46 ^{NS}	0.54 ^{NS}
LS 345 Peris			-	2.45*	2.85*	2.19*	2.65**	2.74**
Duroc				-	3.41**	3.18**	3.42***	3.46***
Hampshire					-	0.36 ^{NS}	0.12 ^{NS}	0.45 ^{NS}
Perhib						-	0.34 ^{NS}	-
F1xPietrain							-	0.30 ^{NS}
F1xSeghers								-

* $t_{78,0.05}=1.99$; ** $t_{78,0.01}=2.64$; *** $t_{78,0.001}=3.42$

For appreciation fat were determined humidity, iodine and appreciated by scoring consistently. The values obtained are presented in Table 4. Humidity content of fat is between 12.79% and 18.9%, which corresponds to a consistent good fat, coupled with score values. The lowest score of consistency (3.2) occurs in hybrid F1xPietrain and highest values in Duroc breed (4.1) and Large

White breed (4.0). LSP 345 Peris itself on good value consistency (3.4), with a value of 12.96% humidity. Regarding iodine, which is the amount of iodine (g) fixed by 100 g fat, the values obtained at the breeds and hybrids analyzed are smaller than the upper limit of iodine index of species (77 g). Dates obtained from the analysis are presented in Table 4.

Table 4. Fat quality parameters

Breed	U% $\bar{X} \pm S_x$	Iod index $\bar{X} \pm S_x$	Consistence
Large White	13.80±0.52	65.00±0.16	4.0
Landrace	12.79±0.53	64.02±0.47	3.5
Linia S 345 Peris	12.96±0.61	66.05±0.43	3.4
Duroc	14.21±0.59	65.21±0.27	4.1
Hampshire	13.18±0.56	62.13±0.41	3.9
Perhib	18.90±0.56	64.27±0.31	3.8
F1xPietrain	18.60±0.55	68.31±0.29	3.2
F1xSeghers	14.48±0.56	62.95±0.19	3.4

In Table 5 presents the test results for testing the significance of student differences iodine value between breeds and hybrids. Regarding iodine, hybrid F1xPietrain is highly differing significantly from all other breeds and hybrids, with the highest content of iodine

(68.31g), also consistently shows the lowest value. Almost between all breeds and hybrids studies are significant differences in terms of iodine content. Insignificant differences occur between breeds Large White and Landrace / Duroc, Landrace and Perhib and between Hampshire and F1xSeghers.

Table 5. Student Test for Iod index

Breed	Large White	Landrace	LSP 345	Duroc	Hampshire	Perhib	F1xPietrain	F1xSeghers
Large White	-	1.56 ^{NS}	2.23*	1.54 ^{NS}	2.78**	2.15*	3.45***	2.36*
Landrace		-	2.68**	2.31*	2.61*	0.89 ^{NS}	3.43***	2.42*
LS 345 Peris			-	2.38*	2.86**	2.31*	3.54***	2.84**
Duroc				-	2.75**	2.37*	3.68***	2.62**
Hampshire					-	2.35*	3.58***	0.34 ^{NS}
Perhib						-	3.84***	2.35*
F1xPietrain							-	3.52***
F1xSeghers								-

* $t_{78,0.05}=1.99$; ** $t_{78,0.01}=2.64$; *** $t_{78,0.001}=3.42$

Consistence was appreciate by scoring from 1 to 5; 1=very soft, 5= very hard

4. Conclusions

Percentages of protein and fat, and physicochemical qualities of fat breeds and hybrids in the study, places these animals in category "animals that produce housing quality", given that meat quality is always inextricably linked to body fat and quality.

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