ON SOME CHARACTERISTICS OF PORK FROM PROGENY OF DIFFERENT ESTONIAN LARGE WHITE BREED BOARS

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Background. Not only consumer but also meat industry prefer pork with high lean meat content and normal pH. At present the quality of pork, produced in our Republic, is relatively low and unstable. Our problems are low lean meat content and high percentage of PSE-meat. On the basis of our experimental data from 1991-94 43.2% of pork carcasses, produced in our Republic belonged to R-class (lean meat content 45-50%) according to EUROP- classification of pork. Only about 10% of carcasses belonged to E-class (lean meat content ≥ 55%).Lean meat content of carcasses produced on middle-sized farms, was 47.8%. However, at the same time lean meat content of carcasses produced on experimental farm was 52.5%. About 50% of investigated pork carcasses was PSE-meat. It is highly necessary to recommend suitable boar lines to produce pork with high lean meat content and normal pH.

Objectives. The aim of this paper was:
to investigate pork quality produced on Tartu Experimental Pig Farm (TEPF) on the basis of boar lines;
to determine lean meat content in carcasses;
to distribute the carcasses by lean meat content according to EUROP-classification.

Methods. The investigation was carried out on 415 the Estonian Large White breed pig carcasses from TEPF from 1994 to 1995. Piglets were brought from 16 different cooperatives and farms. The origin of piglets by boar lines and sows was also known, they were progeny of 74 boars. The pigs were slaughtered at the age from 6 to 7 months. Carcass weight, pH_1, and lean meat content were determined after slaughtering. pH_{48}, water content (GOST 9793-74), water binding capacity (Grau and Hamm...1953) and colour (visually, max 9 points) were measured after chilling during 48 hours. Lean meat content was determined with Ultra FOM-100 (Instruction...1993), or with ZP-method (two point method)(Verordnung... 1990). In the tables are given data according to ZP-method.

Results and discussion. In Table 1 are presented the data of pork quality characteristics of 10 boar progeny who gave the pork with the best characteristics and 7 boar progeny who gave the pork with worse parametres. The comparision is made on the basis of lean meat content, colour and pH_{48}. There are separately characteristics of carcasses and of pork.

The pork with better quality characteristics gave the progeny of the following boars: Kyyka 6267, Krossi 41 and Taika 1247 but the pork with worse quality characteristics gave the progeny of the following boars: Nutt 24409, Taika 12343 and Kynkku 74183.

Mean values from 415 progeny were: carcass weight - 71.4·kg; pH_1 - 6.5; pH_{48} - 5.6; water content - 73.93%; water binding capacity - 46.15%; colour - 4.8 points and lean meat content by ZP-method - 52.95% (Table 2).

Minimum value of lean meat content was 44.39% (Paasu 2239), and maximum value was 63.97% (Krossi 41).Minimum value of colour was 2.0 points (Taika 12343) and maximum value of colour was 9.0 points (Krossi 41).

In Table 3 the investigated carcasses are distributed by pH_{48} to PSE, normal and DFD-meat. Majority of pork (55.7%) belonged to PSE ($pH_{48} \leq 5.59$). Half of carcasses (52.0%) of boars belonged to normal, but the most part of sows (62.8%) and barrows (70.8%) belonged to PSE. In Table 4 the investigated carcasses are distributed to classes by lean meat content (AID 1187... 1992; Tapasigade ...1994). 48.9% of carcasses belonged to U-class, then follow E and R-class (29.3% and 21.4%, respectively). Among boars and sows the most part of carcasses belonged to U-class (45.5% and 53.3%). 44.9% of carcasses of boars belonged to E-class. In 7.0% from investigated carcasses lean meat content was above 60% (S-class).

On the basis of lean meat content half of carcasses studied during 1992-1995 (Table 5, n=901) belonged to U-class (50.5%); the next was R-class (26.6%).

Conclusions. 1. Among the investigated pork the part of PSE-meat is rather large (55.7%).
2. The investigated pork from TEPF is characterized by high yield of lean meat (52.95%), the most part (48.9%) of carcasses belongs to U-class (lean meat content 50-55%).
3. The part of carcasses in E-class is increasing from year to year on TEPF (1992-7.4%; 94-22.9%; 95-37.2%).

Pertinent literature.
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Table 1. Carcass and pork quality characteristics (arithmetical means) of some best and worse boars

Boars name and No	No of tested progeny	Carcass characteristics			Pork quality characteristics			
		Carcass weight, kg	pH_1	Lean meat content, %	pH_{48}	water content, %	water binding capacity, %	colour (max 9 p.)
The best boars on the basis of progeny's pork quality characteristics								
Krossi 41	4	76.8	6.6	60.88	5.9	75.15	53.45	7.5
Taika 91205	12	76.4	6.3	59.03	5.6	74.48	43.89	4.2
Kunkku 857	10	73.7	6.4	55.47	5.5	73.91	44.17	5.1
Jampo 27391	6	70.7	6.9	56.61	5.6	73.81	46.08	4.5
Paasu 79365	4	67.8	6.9	56.64	5.7	73.24	56.33	5.0
Keikkari 96684	6	75.5	6.1	56.20	5.6	73.94	46.96	5.3
Taika 91175	11	67.9	6.7	51.10	5.7	74.12	44.50	5.8
Orion 16571	7	75.5	6.4	54.57	5.7	74.58	52.06	5.9
Taika 1247	7	72.4	6.7	58.53	5.7	74.76	49.00	6.0
Kyyka 6267 and others	8	73.5	7.0	55.16	5.6	71.66	48.53	6.1
The worse boars on the basis of progeny's pork quality characteristics								
Rönsy 1931	5	67.6	6.2	55.22	5.4	73.73	44.83	3.6
Paasu 2239	8	72.7	7.0	47.07	5.5	73.21	49.30	5.2
Fast 569	9	79.9	6.4	47.64	5.5	74.34	47.56	4.7
Jampo 141	7	73.4	6.2	50.46	5.5	73.27	44.23	4.3
Nutt 24409	11	69.1	6.4	49.85	5.4	73.49	42.99	4.2
Taika 12343	4	72.5	6.2	48.48	5.4	74.21	41.59	3.3
Kunkku 74183 and others	4	70.2	6.3	50.54	5.5	73.98	43.82	4.3
mean value	415	71.4	6.5	52.95	5.55	73.93	46.15	4.8

Table 2. Pork quality characteristics in 1994-95

No	Characteristics (n=415)	$\bar{x}^1$	$x_{min}{}^2$	$x_{max}{}^3$	D^4
1.	Carcass weight, kg	71.4	50.4	97.0	46.6
2.	pH_1	6.5	5.7	7.3	1.6
3.	pH_{24}	5.6	5.3	5.6	1.3
4.	pH_{48}	5.55	5.3	6.6	1.3
5.	Water content, %	73.93	68.76	76.40	7.64
6.	Water binding capacity,%	46.15	31.92	60.13	28.21
7.	Colour, (max 9 points)	4.8	2.0	9.0	7.0
8.	Lean meat content,%	52.95	44.39	63.97	19.58

$\bar{x}^1$ - arithmetical mean
$x_{min}{}^2$ - minimum mean
$x_{max}{}^3$ - maximum mean
D^4 - difference

Table 3. Classification of carcasses from TEPF by pH_{48} on the basis of sex (1994-1995)

	No of tested progeny	Distribution of carcasses by pH_{48}, %		
		PSE pH≤5.59	N 5.6≤pH≤6.29	DFD pH≥6.3
Boar	179	46.9	52.0	1.1
Sow	172	62.8	37.2	-
Barrow	24	70.8	29.2	-
Mean value	375	55.7	43.7	0.6

Table 4. Classification of carcasses from TEPF by **lean meat content** on the bases of sex (1994-1995)

	No of tested progeny	Distribution of carcasses by lean meat content, %				
		E	U	R	O	P
Lean meat content, %		≥55	50...55	45...50	40...45	≤40
Boar	187	44.9	45.5	9.1	0.5	-
Sow	200	18.0	53.5	28.5	-	-
Barrow	24	4.2	33.3	58.3	4.2	-
Mean value	411	29.3	48.9	21.4	0.4	-

Table 5. Classification of carcasses from TEPF by **lean meat content** from 1992 to 1995

Class	Lean meat content, %	Distribution of carcasses by lean meat content, %				
		1992 (n=315)	1993 (n=175)	1994 (n=223)	1995 (n=188)	Total 1992-95 (n=901)
E	≥55	7.4	20.8	22.9	37.2	20.0
U	50-55	49.3	57.2	51.1	46.3	50.5
R	45-50	42.2	20.2	25.6	16.5	28.6
O	40-45	1.1	1.8	0.4	-	0.9
P	≤40	-	-	-	-	-