Certain Aspects of Pork Quality

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SUMMARY: Intensive modern technologies of growing and feeding pigs, including breeds of high meat productivity, under conditions of large industrial complexes predetermine deviations of meat quality, negatively influencing consumer properties of finished products.

On the basis of research data it was established that factor of breed influences pork quality in a greater extent than growing and feeding technology.

INTRODUCTION:Low quality of meat products manufactured during last years is directly bound with low quality of initial raw material. This is especially characteristic of raw material, received from industrial complexes for animal growing. At present, traditional soviet technologies of animal growing on commodity farms possess elements,used at industrial complexes, that is intensive feeding and growing without grazing on pastures.

Intensive growing technologies imply great variability in conditions of animal keeping, fattening rations, etc. However, it still seems impossible to eliminate negative influence of hypodynamia and of stress on animal metabolism, this leading to poor quality of meat. This state of things is aggravated by the fact that feeding of animals, selected for high meat productivity, leads to availability of pigs with low stress-resistance.

The Institute received data, evidencing about vivid tendency towards deviations in quality of meat supplied for industrial processing. For example, if at the end of 70's meat industry received for processing only 40% of PSE and DFD meat, nowadays, volume of such raw material increased to 90%.

Research was done in order to reveal deviations in meat productivity and quality of pork from pigs of different breeds and of different intensiveness of feeding.

MATERIALS AND METHODS: Carcasses of pigs were studied, belonging to different cross-breeds and zone types, received for slaughter from forms with intensive technology of growing and feeding (type 1), and also from commodity farms (type 2) representing different raw-material regions of the country (Russia, Moldova).

Animals were transported to Leningrad, Podolsk and Kishinyov meat-packing plants, the covered distance did not exceed 50km. Pre-slaughter holding lasted 3-5 hours. Pigs were stunned by electric current with following parameters: commercial frequency - 50 Hz, voltage 65-100V, duration - 6-8s. In order to establish meat productivity and meat quality of slaughtered animals representing the studied groups, weight of cooled carcasses was determined as well as yield of muscle and fat tissues, meatness ratio. Using portable pH-meter TMC ("Ultra-X", Germany), type 300. 45-60 min. post mortem (pH_1) and after 24 hours of chilling at 0-2°C(pH_{24}) pH-value of muscle tissue was determined in order to divide carcasses into quality groups(N, PSE and DFD).

RESULTS AND DISCUSSION: Pig carcasses of different groups were boned. Content of muscle

tissue and of fat tissue was determined as well as meat/fat ratio.

Data concerning meat/fat ratio of pig carcasses of the studied groups are given in Table 1.

Table 1
(n=5-8)

Crossbreds, zone type of pigs	Type of farm	Carcass weight, kg	Yield, %		Meat/fat ratio
			muscle tissue	fat tissue	
1.Large White x Landrace	Industrial complex, I type	71.4	60.2	26.6	2.26
2.Large White x Landrace x Moldavian Meaty	- " -	79.6	66.2	20.4	3.09
3.Central	Commodity Farms, II type	63.6	63.8	20.1	3.17
4.Southern	- " -	61.0	56.0	30.4	1.83
5.Western	- " -	67.0	57.0	28.3	2.01
6.Steppian	- " -	59.4	62.9	25.5	2.46
7. Syberian	- " -	57.2	60.8	27.2	2.23
8.Large White	- " -	59.6	59.3	23.1	2.56
9.Landrace	- " -	54.2	54.2	30.9	1.77

Data of Table 1 show that pigs supplied from farms of I type are heavier and more uniform by weight. Pigs received from farms of II type show greater variability of weight from 54.2 to 67.0 kg.

Pigs from farms of II type give the biggest (63%) yield of muscle tissue.

Meat/fat ratio, being one of the meatness parameters, is sufficiently high in these groups: 2.26 - 3.09 units.

Analysis of results of morphological study of pig carcasses, belonging to specialized meaty breeds (N=3-9), showed that among these groups the best parameters show pigs of central, steppian and syberian zone types, as musclw tissue content in their carcasses equals 63.8; 62.9 and 60.8%, accordingly. In the average, meat/fat ratios for these groups are relatively high, making 3.17; 2.46 and 2.23 units, accordingly.

It was established that yield of muscle tissue is influenced rather by breed than by intensiveness of animal feeding.

Technological properties of meat, obtained from pigs of different breeds, were determined by dynamics of pH change. According to value of this index, carcasses were divided into 3 quality groups: N, PSE and DFD. This division of carcasses into quality groups is given in Table 2.

From data of Table 2 it becomes clear that (in spite of intensiveness of animal feeding) more than 80% of all studied carcasses possess exudative muscle tissue (PSE meat). Certain tendency could be observed: increasing number of carcasses with quality deviations is accompanied by increase of muscle tissue yield(groups 3,6,7), supporting opinion

Table 2

Crossbreds, zone type of pigs	Number of carcasses	Quality groups		
		N	PSE	DFD
1. Large White x Landrace	2905	7.6	84.0	8.4
2. Large White x Landrace x Moldavian Meaty	1814	10.3	85.2	4.5
3. Central	130	-	100.0	-
4. Southern	121	4.8	90.4	4.8
5. Western	129	13.8	86.2	-
6. Steppian	121	-	100.0	-
7. Syberian	123	-	100.0	-
8. Large White	110	10.0	90.0	-
9. Landrace	116	6.3	93.7	-

of many authors, that purposeful selection towards meatness lead to occurence of PSE meat.

CONCLUSION: Results of research aimed at the study of meat productiveness and meat quality of pigs depending on breed and intensiveness of feeding, showed that usually meat processors have to deal with pigs characterized by great variability of quality.

Revealed shortcomings in quality of meat raw material could be at least partially improved by selection, aimed at breeding of stree-resistant animals, suitable for industrial growing on the basis of intensive technologies.