QUALITY AND FACTORS INFLUENCING IT

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to acute necessity of satisfying consumer market demand in high-quality beef of low , research aimed at revealing of factors for achievement of this goal, acquires spe- l importance.

s performed on young beef animals allowed to conclude that the main factors, respon- le for high indices of meat productivity of cattle and for meat quality are conditions rowing and of maintenance of cattle, and also its breed and sex.

RODUCTION

of the main food products for human nutrition and the most important source of protein eat, namely beef. Out of the total meat consumption in Russia beef constitutes almost . Quality and quantity of produced beef directly depend on the level of meat producti- y of beef cattle, this being in its turn dependent on different factors: age, sex, breed, ding rations and conditions of cattle growing.

h of these factors effects morphological composition of a carcass, physico-chemical and nsoleptical characteristics of meat quality, which define quality of meat products. ing into account that quantitative and qualitative parameters of beef are connected h the above-mentioned factors, it was interesting to establish interrelations of such ices as live weight, carcass weight, morphological composition of carcasses and quality eat with sex and breed of animals.

s research allowed to determine quality parameters characteristic of this or that group animals and to develop scientifically-based recommendations for fuller use of the gene- potential of meat productivity of different breeds of cattle and for purposeful and ef- tive utilization of beef carcasses.

TERIALS AND METHODS

o hundred 18-months old bulls and steers of Simmental and Shorthorn breeds served objects research. Initially young cattle was grown indoors and then transferred to lot feeding. ding ration was the same for all animals. Nutritive value of feeds was controlled through emical analysis. Monthly weighting was used to control cattle growth. According to weigh- g results daily gain and growth rate were calculated. Meat productivity and its quality re studied according to results of control slaughter. Animals were delivered to slaughter- ses in trucks. Pre-slaughter lairage lasted 24 hours from the moment of delivery. Ani- ls were stunned by electric current of commercial frequency (50 Hz) and 90-100 V by ap- ication of electrodes on the cervical part of head upon piercing of hide not deeper than 5 mm, time of stunning was 8-10 sec. 24 hours post mortem morphological composition of rcasses was determined and samples of M. longissimus dorsi were taken from 9-12 ribs, be- ds, average sample of carcass meat was taken. Samples were analysed 48 hours post mortem. emical composition, biological value and technological parameters of meat were determined

by common methods.

RESULTS AND DISCUSSION

When tests were performed, liveweight of young beef animals was practically the same (60.7-62.3 kg). However, by 8th month of age Simmental bulls and steers exceeded Shorthorns by 3.8 and 1.7 kg respectively, thus, at the age of 18 months this difference was 16.8 kg or 3.6% for bulls and 9.3 kg or 2.1% for steers.

Daily gain analysis at different age evidence that the highest daily gain of the studied groups of animals was observed in the period of 1.5-8 months, i.e. when conditions of keeping were excellent (in stables with controlled microclimate). When animals were transferred to lot feeding, average daily gain of all groups decreased. However, bulls of both breeds showed the highest liveweight increase. The highest liveweight and growth performance were characteristic of the Simmental animals.

Thus, such factors as breed and castration determine growth performance of young beef cattle.

In order to determine meat productivity of animals, control slaughter was conducted. Data of control slaughter, given in table 1, evidence about effect of both breed and sex on changes in carcass weight and yield of intramuscular fat.

Evaluation of carcass quality by one of its main criterion - muscle tissue content, as source of valuable protein, - has special significance from the viewpoints of processing technology and consumer demand. With this aim total dissection of carcasses of the studied groups was performed.

TABLE 1 Results of control slaughter

Indices	Simmentals		Shorthorns	
	bulls	steers	bulls	steers
Liveweight before delivery,kg	485.6	459.6	468.8	450.5
Pre-slaughter liveweight, kg	462.6	437.8	447.8	430.5
Weight of carcass, kg	259.5	248.7	258.4	248.4
Yield of carcass, %	56.1	56.8	57.7	57.7
Weight of interior fat, kg	14.3	15.3	17.9	19.4
Yield of fat, %	3.1	3.5	4.0	4.5

Analysis of the obtained data proves that young Shorthorn cattle, being typical representative of beef meat animals, shows higher carcass yield = 57.7%, as compared to combined Simmental breed,56.1%. It was especially clear from the fleshing index of carcasses, i.e from yield of lean meat for 1 kg of bones.

Fleshing index of carcasses of young animals of meat breeds is higher by 15.3 and 10.7% for bulls and steers, respectively. It was also established that yield of lean meat is influenced by such factors as breed and sex.

For evaluation of meat quality of young beef animals as dependent on sex and breed, chemi-

l composition and physico-chemical characteristics were analysed, determining the nutri-
ve value and technological properties of this meat.

BLE 2 Morphological composition of carcasses of bulls and steers

Indices	Simmentals		Shorthorns	
	bulls	steers	bulls	steers
ght of chilled carcass, kg	257.5	247.7	256.4	246.5
cluding: boneless meat, kg	197.0	193.2	202.3	196.7
%	76.5	78.0	78.9	79.8
Bones, kg	51.2	46.1	45.6	42.4
%	19.9	18.6	17.8	17.2
Sinews and cartilages, kg	9.3	8.4	8.5	7.4
%	3.6	3.4	3.3	3.0
eshing index	3.84	4.19	4.43	4.64

ta on chemical analysis, on physico-chemical characteristics and nutritive value of scle tissue of Simmental and Shorthorn bulls and steers are given in table 3.

ta of table 3 show that meat of Shorthorn cattle possesses higher indices of biological lue, of water-holding ability and lower cooking loss than Simmentals. Influence of sex animals on physico-chemical characteristics of meat was also noted.

BLE 3 Chemical composition, biological value and technological parameters of average sample of carcass and of M. longissimus dorsi samples of tested young animals

Indices	Simmentals		Shorthorns	
	bulls	steers	bulls	steers
1	2	3	4	5
Average sample of a carcass				
y matter, %	35.59	36.15	35.91	35.76
rotein, %	20.39	20.47	20.43	19.95
t, %	14.25	14.73	14.53	14.86
ryptophane, mg %	351.29	331.18	359.96	335.96
xyproline, mg %	148.85	120.43	139.52	116.25
ryptophane : Oxyproline	2.36	2.75	2.58	2.89
	5.85	5.77	5.87	5.80
ter-holding, %	61.52	58.44	62.80	60.36
oking loss, %	35.40	36.52	34.43	35.88
M. longissimus dorsi				
y matter, %	23.87	23.71	25.38	24.85
rotein, %	22.18	21.93	23.61	22.93
t, %	0.70	0.79	0.78	0.92

TABLE 3, continued

1	2	3	4	5
Tryptophane, mg %	432.04	419.80	430.58	459.31
Oxyproline, mg %	64.45	53.30	62.22	54.67
Tryptophane:Oxyproline	6.70	7.88	6.92	8.40
pH	6.12	6.01	6.20	6.05
Water-holding, %	64.10	62.15	66.82	62.78
Cooking loss, %	32.45	33.95	30.24	33.09

For bulls meat less fat content, higher amount of connective tissue proteins and, consequently, lower ratio of tryptophane and oxyproline are characteristic. During evaluation meat quality of bulls and steers by technological parameters it was established that meat of steers had higher pH-values, higher water-holding ability and lower cooking losses. These quality characteristics of bull meat should be born in mind when raw material for meat products manufacture is chosen.

CONCLUSIONS

Results of studies of quantitative and qualitative characteristics of carcasses and meat of young beef cattle as dependent on breed and sex show vividly that raw material, available for processing, is different. These data prove the necessity of differential approach to evaluation and rational use of raw material in the meat industry.