STUDYING THE QUALITY OF CUTS BY THE NEW CALF CUTTING DIAGRAM

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Abstract

The study of the chemical and fatty acid veal stew based on the results of the study makes it possible to develop a new differentiated scheme for cutting veal carcasses, which involves the use of cuts for industrial processing, public catering and for sale through a distribution network. In the future, a scheme for cutting veal into cuts, both bone and boneless, developed in relation to the conditions of Kazakhstan, will be taken as the basis for the development of the state standard ST RK “Veal. Carcasses and cuts”.

Keywords: veal, quality, chemical composition, fatty acidity of veal

Introduction

One of the main criteria for the validity of the assessment qualities of slaughtered animals are indicators of morphological, chemical composition in the individual carcass cuts. This approach allows differentiation not only to assessment, but also to technologies for processing raw meat materials. Morphological and chemical composition, biological value and technological properties of veal were studied by the results of deboning carcasses during the day to a temperature of +4°C on the example of 9 cuts of the front and rear parts. Meat pH determined according to ISO 2917, content of protein was done according to GOST 25011. Determination of fatty acid composition was done by using gas chromatography through the GOST R 55483 - 2013.

The study of the chemical and fatty acid veal stew based on the results of the study makes it possible to develop a new differentiated scheme for cutting veal carcasses, which involves the

use of cuts for industrial processing, public catering and for sale through a distribution network. In the future, a scheme for cutting veal into cuts, both bone and boneless, developed in relation to the conditions of Kazakhstan, will be taken as the basis for the development of the state standard ST RK “Veal. Carcasses and cuts”.

In recent years, increased the number of studies on the prediction, as the meat productivity, so and the quality of meat. One of the main criteria for the validity of the assessment qualities of slaughtered animals are indicators of morphological, chemical composition individual carcass cuts. This approach allows differentiated approach not only to assessment, but also to technologies for processing meat raw materials. The development of a differentiated scheme for cutting veal carcasses is based on comprehensive studies of nutritional, biological value and functional properties pulp of individual sections of the carcass.

It is interesting both from the point of view of the quality of the meat and the formation meat in different types and breeds of farm animals. In accordance with this different schemes and sorting of carcass cuts are being developed. [1]

Material and methods

Experimental studies for the development of differentiated schemes butchering carcasses of calves on the cuts carried out in industrial conditions LLP "Bayserke Agro". On the basis of analysis and generalization, taken in the practice of domestic and foreign production circuits, the principles and methods of cutting a carcass for trafficking and production of semi-finished products, smoked products, sausage products, and also results of our own research food, biological value, functional, consumer and culinary properties meat different parts mascara, designed principally new scheme of cutting veal carcasses to cuts boneless (27 names) and on the bone (21 name). For foundation schemes butchering carcasses were taken classification of veal from the international standard ECE UN.

The development of the new standard ST RK, providing for the use of common principles and requirements to the cutting of carcasses of calves on the cuts, a common specification, and the names of the cuts, will provide the possibility of contingency, rational use, both in the industry, so and in the trade with the taking into account requests of buyers, which greatly enhance the culture meat market.

The study of quality of cuts provided for a comprehensive assessment of the morphological composition, food, biological value, functionality, consumer and culinary properties of meat

of different parts of the carcass with a view to rational use of cuts, both for industrial processing and public power, so and for the realization through a trading network .

The morphological, chemical (moisture, fat, protein) technological properties of veal of various cuts were studied.

Morphological and chemical composition, biological value and technological properties veal studied on results deboning cooled to within days to a temperature +4 ° C carcasses in Example 9 cuts the front and rear parts. The pH was determined according to ISO 2917: 1999. The weight fraction of the protein identified according to GOST 25011-81, Determination of fatty - acid composition by gas chromatography was performed on GOST P 55483 - 2013.

Results and discussion

In retail, veal comes in the form of carcasses or longitudinal half-carcasses with the carcass of the lumbar muscles (tenderloin), kidneys, amniotic and pelvic fat and goiter. The carcass is divided along the ridge through all the vertebrae into two half-carcasses, leaving the spinous processes of the vertebrae in the right half. According to the State Standard GOST 23219-78 each half-carcass is cut into 9 cuts (table 1), which are divided into three categoties the I, II and III (Fig. 1). Approximate yield of meat in %: 1st grade-71, 2nd-17, 3rd-12.

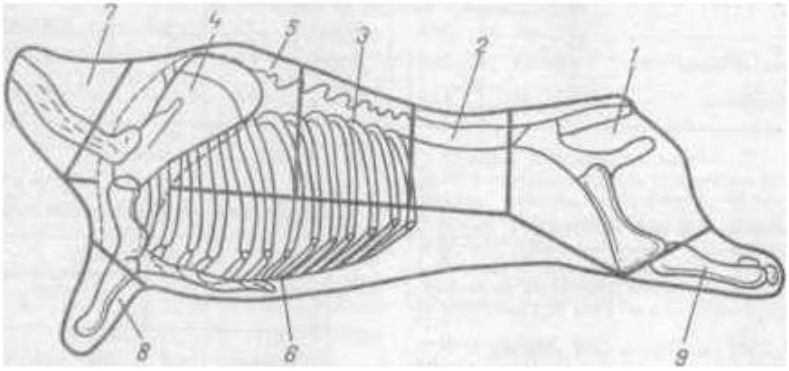

Figure 1. Cutting scheme of veal carcass: 1-hip part; 2-lumbar part; 3-dorsal part; 4-scapular part; 5- foearm edge; 6-chest part with a flank; 7-neck part; 8-forearm; 9-Shin

The anatomical location and the functional loads performed determine the properties and composition of cuts. In this regard, figure ratio boneless meat and bones may not in full measure to characterize the quality cuts. A large value for the characteristics of boneless cuts as the protein product is quantitative content total protein and share connective - woven protein (Table 1).

In Table 1 shown the average data of the chemical composition of the cuts, from which is evident, that the content of moisture in the cuts varies in the range 69,90-76,80% and is closely associated with the presence of fat . Provided groin, containing 8.90% fat, and 69.90% moisture.

Table 1. The chemical composition of veal cuts

Name of cut	Moisture %	Fat . % (M ± m)	ON . % (M ± m)	EC . kcal (M ± m)
Hip	75.17 ± 0.36	2.79 ± 0.23	21.25 ± 0.-8	110.11
Scapular	74.85 ± 0.60	2.10 ± 0.77	20.50 ± 0.45	118.90
Dorsal .- lumbar	73.78 ± 0.19	2.88 ± 0.70	21.63 ± 0.22	121.38
Thoracic - costal	74.23 ± 0.90	3.7 ± 0.57	21.13 ± 0.92	122.93
Cervical	75.90 ± 0.66	1.40 ± 0.300	22.40 ± 0.24	102.20
Subscapular	74.0 ± 0.45	2.50 ± 0.67	21.00 ± 0.36	115.50
Tenderloin	76.80 ± 0.64	1.70 ± 0.38	20.80 ± 0.50	98.50
Flank	79.90 ± 0.53	2.90 ± 0.64	20.80 ± 0.19	163.30
Shank	74.30 ± 0.60	1.50 ± 0.25	22.00 ± 0.17	119.50

Nutritional value in cuts in greater degree depends on the qualitative composition of proteins meat associated both with digestibility, so and with the degree of balance of amino acid composition.

According content total protein significant differences are not found (34,0-36,5%) (Table 2). The small content of connective - woven proteins found in Flap, in the rear and front Shank, a rib portion and zaostnom muscle blade cut, in the front and rear parts of the brisket. It should be noted, that the content of connective - woven proteins is much less in comparison with bran adult cattle.

Table 2 Nutritional value of meat cuts

No.	Sample Identification	Name of indicators, the unit of measurement	Norm on ND	Actual Results
1	1 (shackled)	Mass fraction of sodium chloride ,%		0.094
		Active acidity , pH	5.5-5.8	5.602
		Mass fraction of total protein ,%		36.5
2	2 (shoulder blade)	Mass fraction of sodium chloride ,%		0.095
		Active acidity , pH	5.5-5.8	5.709
		Mass fraction of total protein ,%		29.7
3	3 (lumbar part)	Mass fraction of sodium chloride ,%		0.086
		Active acidity , pH	5.5-5.8	5.514
		Mass fraction of total protein ,%		36.2
4	4 (dorsal part)	Mass fraction of sodium chloride ,%		0.139
		Active acidity , pH	5.5-5.8	5.563
		Mass fraction of total protein ,%		34

The functional role of polyunsaturated fatty acids is normalization of activity of all membrane structures of cells and intracellular information transfer. In addition, polyunsaturated fatty acids, especially- arachidonic, are the precursors of the formed of them extraordinary- but active and important mediators of metabolism reactions in the body – eicosanoids and isoeicosane.

The fatty acid composition of veal cuts is shown in Table 3.

Table 3. The fatty acid composition of cuts of veal (%)

Name of indicators	Maximum allowable level on ND	Actual value			
		Sirloin	Scapular part	Lumbar	Dorsal part
1	2	3	4	5	
The fatty acid composition of the fat phase of the sample					
C 4: o butyric acid		0.05	0.13	0.08	0.04
Sbu caproic acid	0.06-0.09	-	-	-	-
C s : o caprylic acid	0.04-0.08	-		-	-
With th : caprin acid	0.10-0.16	0.02	-	-	-
Spulauric acid	0.67-1.70	0.02	-	-	-
C i 4: o myristic acid	3.10-3.45	2.06	1.91	2.1	2.05
C i 4: i ** myristoleic acid	0.2	0.48	0.37	0.59	0.48
C i 5: o pentadecyl acid	0.07-0.13	0.47	0.27	0.32	0.40
C 16: 0 palmitic acid	24.60-26.25	24.54	24.59	24.47	24.86
C i 6: i palmitoleic acid	2.9-3.0	2.68	3.3	3.89	2.93
C 17: 0 margaric acid	0.39-0.63	1.22	0.9	0.94	1,07
C i **7: i** tetradecetic acid	0.9-1.1	0.58	0.6	0.68	0.58
C 18: 0 stearic acid	19.14-23.0	30.04	22.13	21.01	27.16
C 1 s . in 9 s ** oleic acid	4,5-40,3	29.8	40.64	39.39	33.03
C i 8: in 9 elaidic acid	0.3-1.3	3.44	1.91	2.48	3.06
C 18: 2 pbs ** linoleic acid	3.13-3.79	2,33	1.97	2.16	2,3
C i8: 2n6t linoleidic acid		0.33	0.1	0.4	0.36
C i 8 Zpb gamma - linolenic acid	0.37-0.47	-	-	0,07	0.06
C i 8: ZpZ alpha - linolenic acid	0.20-0.39	0.33	0.27	0.4	0.34
Sgo : o arachinic acid	0.19	0.26	0.11	0.14	0.19
C 20: in 9 gondoic acid	0.6-0.7	0.47	0.32	0.33	0.35
Sgo : 2 eicosadiene acid	0.07-0.10	0.02	-	-	0.02
C 22 0 behenic acid	0.1	0,07	-	-	0,03
Amount of unidentified acids		0.7	0.37	0.45	0.58
PUFA:MUFA: SFA	1:3.47:3.36	1:2.50:2.67	1:3.0:3.20	1:2.90:2.95	1:2.80:2.70

Analysis of fatty acid composition showed that the ratio ω6:ω3, PUFA:MUFA:SFA, (PUFA+MUFA):SFA is the most balanced cut is sirloin part. In addition, meat in sirloin part significantly superior to the standard in the content of polyunsaturated fatty acids.

Given the high correlation between the tenderness of meat and lability collagen, to characterize the consistency of boneless cuts and individual muscles were determined not

only the content of the connective tissue (connective - woven proteins) and its lability (degree tenderize ™) to hydrothermal effects (cooking), as well as the degree of reducing the mechanical strength of meat (tenderness). From table 4 can be seen , that the greatest proportion by weight in the structure of the carcass takes hip cut (28,80 ± 0.80%), daleelopatochny (14.07 ± 0.16%), thoraco - rib (13,77 ± 0.78%), dorsal – lumbar (12.17 ± 0.39%), cervical (11.98 ± 0.43%), drumstick anterior (4.94 ± 0.15%) and posterior (5.47 ± 0.17 %), flank (4.77 ± 0.13%) and subscapular (4.03 ± 0.12%).
The content of boneless meat and bone varies in depending on the anatomical location of the cut. The average content of boneless meat in the carcass was 76.56%, of them 24.37% - pulp, obtained from hip primal, 10.30% - by spatula, 10.03% - cervical, 9.40% - thoraco - costal and 7.97% - from the dorsal-lumbar cut. (Fig. 2).

Table 4. The output of cuts on bones and boneless

Name of cut	Cuts			Yield of bone in % to the mass of carcass M ± m
	bone	Boneless		
	% to the mass of the carcass M ± m	% to the mass of the cut on the host M ± m	% to the mass of the carcass M ± m	
1	2	3	4	5
Hip	28.8 ± 0.80	84.62 ± 0.14	24.37 ± 0.61	4.43 ± 0.33
Scapular	14.07 ± 0.16	73.21 ± 0.52	10.30 ± 0.10	3.77 ± 0.76
Stato - lumbar	12.17 ± 039	65.48 ± 1.60	7.97 ± 0.88	4.2 ± 0.21
Breast - rib	13.77 ± 0.78	68.21 ± 1.23	9.40 ± 0.54	4.38 ± 0.63
Cervical	11.98 ± 0.43	33.74 ± 0.77	10.03 ± 1.22	1.95 ± 1.03
Subscapular	4.03 ± 0.12	77.53 ± 0.24	3.12 0.97	0.90 ± 0.08
Flank	4.77 ± 0.13	97.87 ± 0.30	4.67 ± 0.46	0.10 ± 0.72
Back drumstick	5.4 7 ± 0.17	61.63 ± 0.90	3.37 ± 0.18	2.10 ± 1.35
Front drumstick	4.94 ± 0.15	67.52 ± 2.13	344 ± 1.30	1.61 ± 0.37
Total	100.00		76.56	23.44

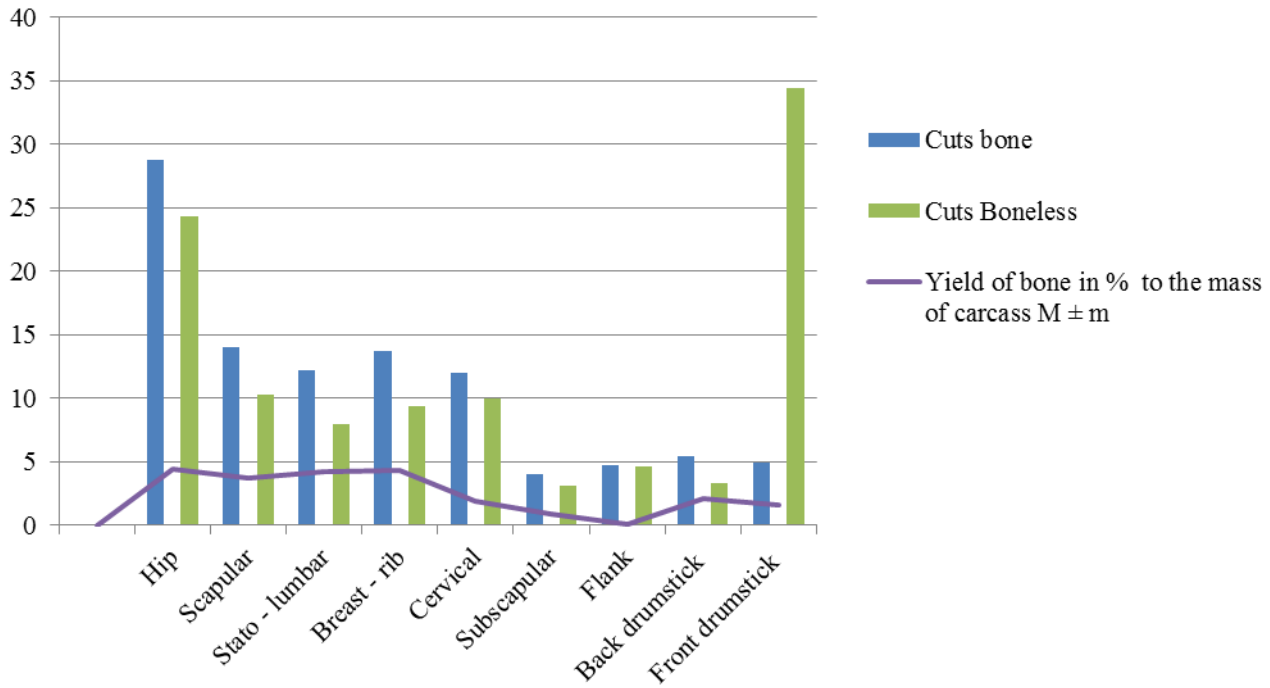

Figure 2. The output of cuts on bones and boneless

The quality of cuts was evaluated by the "meat index" - the ratio of meat to bone, characterizing their full clarity (Fig. 3).

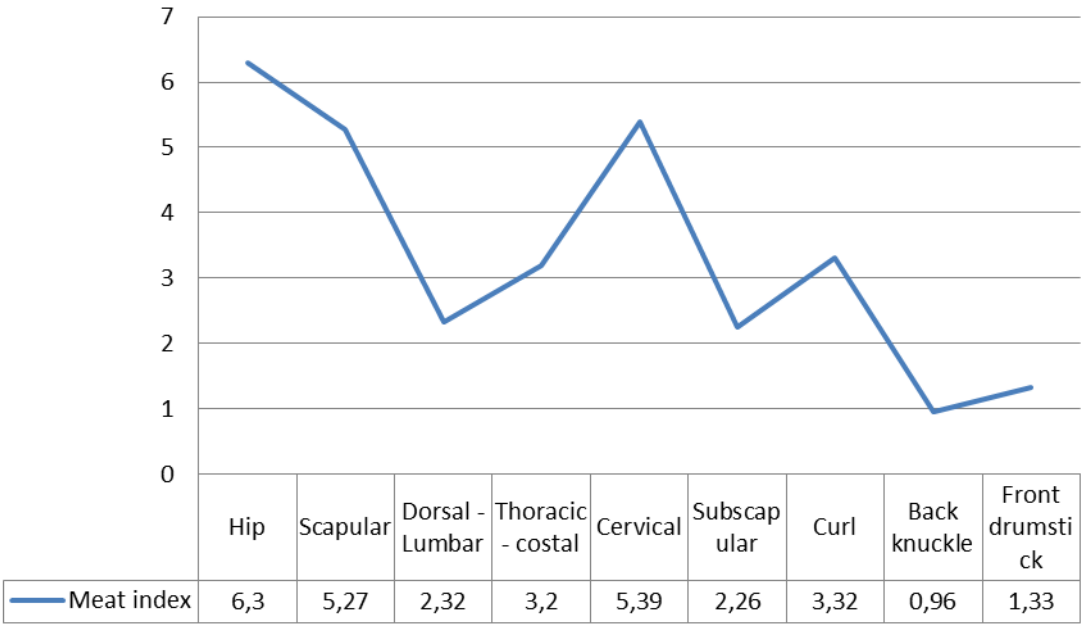

Figure 3. Meat Index

The values of "meat index" shown in Table 5, evidence of the fact, that the most complete cuts, those having the best ratio of boneless meat and bone and hip, cervical and scapular. Of the quarters, the most full-bodied hind quarters in the form of a pistol cut, amounted to 76.60%, of which 24.37% - pulp, obtained from the hip cut, 10.30% - by paddle, 10.03% - cervical, 9.40% - chest - costal and 7.97% - from the dorsal - lumbar cut.

Conclusion

The new differentiated scheme for cutting veal carcasses provides the new opportunity in usage of cuts for industrial processing, public power and for sales through a distribution network.

The scheme for cutting veal into cuts, developed in relation to the conditions of Kazakhstan, both on the bone and boneless, it will be taken over in the framework of development of the state standard ST RK "Veal. Carcasses and cuts".

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