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RESEARCH OF CHEMICAL AND AMINO-ACID COMPOSITION OF THE COMPLEX CUTTING OF CARCASS

Y. M. UZAKOV and D. A. OSPANOVA
Almaty Technological University, 050012 Almaty, Republic of Kazakhstan

Abstract

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The authors have investigated the possibility of expansion of assortment of meat products through the prudent use of lamb (mutton). The results of processing the lamb carcass 1category based on national features supply parts of carcasses in Kazakh culinary art. Defined output and loss of components, represented by their morphological structure, studied biological and nutritional value of the individual parts of carcasses, given the organoleptic characteristics of raw materials.

Key words: cutting lamb, chemical composition, amino acid composition

Introduction

Stabilization of the economy, the expansion of market relations of contemporary Kazakhstan contributes to the development of the meat industry of the country. There is an increase livestock breeding arsenal. However, in recent years, the domestic market is increasing trend of imports of poultry, sausages and canned meat (up to 64%), the proposed assortment of delicatessen products from lamb and horse meat is limited, and meat for functional purposes is practically not produced, although scientists and experts held signify cant and successful development in this direction (Lisitsyn et al., 2005).

The solution of these problems requires:

- Maximum use of local raw meat;
- Filling the domestic market with a wide range of meat products of domestic production;
- Development and implementation of the previously and newly developed products to offer all the functional food meat purpose;
- Improving and increasing the efficiency of existing and creation of new high-tech, export-oriented industries;
- Increasing the competitiveness of products.

One of the solutions to the identified problems of the meat industry is a comprehensive processing of lamb.

At present, the Republic of Kazakhstan has GOST 7596-81 "Meat. Butchering mutton and goat meat for retail trade" and the norms of output cuts at different types of meat, including lamb, identified by order № 37 of Ministry of meat Industry of the USSR from 15.02.1978, which provide only a selection trimmed lamb meat for sausage-food products and canned goods. In this regard, there is a need of complex cutting lamb carcasses to develop national whole-muscle meat products.

Generally known that lamb is one of the main raw materials for the production of food products to the population of Kazakhstan. At present, the share of Kazakhstan lamb for about 25% of all meat produced in the country. Mutton production is mainly carried out by the slaughter and processing of adult sheep, and only about 10% - due to processing in the young age of one year, while it is young is the most suitable material for savory gourmet products.

As it is known, in the processing of the bulk of its mutton sold as carcasses, sides directly to the public, is widely used in the catering for cooking and food products, and only with a lack of other raw meat, so-called off-season, use lamb meat processing plants in the development of canned and some sausage-food products with a narrow range of (Uzakov, 2005).

Materials and Methods

In the laboratory of the Department "Technology of Food Production" Almaty Technological University, we conducted a study on the potential of the integrated use of lamb carcasses 1and 2 categories with the release of raw materials for further

Corresponding author: ospanova.dinara2013@mail.ru

processing and determination of losses. Type has been selected national butchering carcasses of lamb - to articulate parts (zhilikteu).This type differs from the traditional cutting of the fact that the separation of the joints eliminates the ingress of debris into the meat of the bones. The result of this cut is prepared 22 pieces of meat (Figure 1) (Rogov et al., 2009).

Hindquarter is prepared with the appropriate bone: *zhambas*- hip bone; *Orta zhilik* – tibia*; beldeme or belomyrtka* – kidney part of the hip bone and the first vertebra with ribs; *sube* - the first four ribs from Loin; *kabyrga* - 5,6,7 and 8 rib brisket from loin; *tos* - brisket, brisket, along with flank; *omyrtka* - chop the spine without rib bones; *zhauyryn*-the top of the blade; *kari zhilik* - shank; *bugana* - 5 ribs breast, under the scapula; *moiyn* - neck.

Detection of the outputs and morphological structure, chosen as test samples of the parts of mutton carcass 1 category at the cutting of mutton, carried out according to the method given in the order No. 37 of Ministry of meat and milk industry of the USSR of 15.02.1978. Detection of moisture (State Standard 9793-74), fat (State Standard 23042-85), protein (State Standard 25011-81) and ashes detected (State Standard P 53462-2009) by the standard methods. Amino-acid structure of separate cuts was carried out on the gas HP6890 chromatograph with the capillary column HP In-

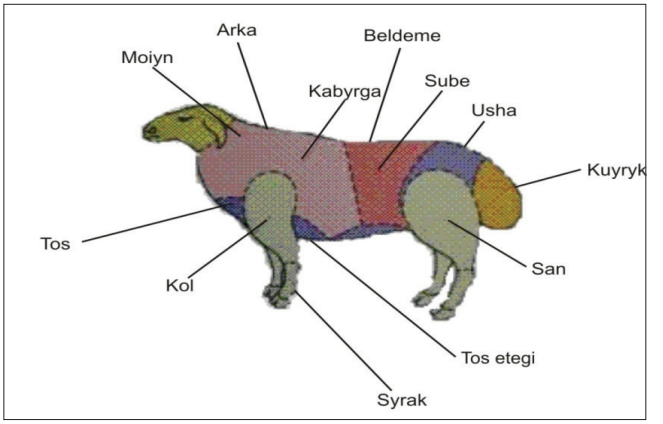

Fig. 1. The national scheme butchering carcasses of lamb

novax30x032x015mkm and the automatic program of processing of chromatographic data.

Results

As the test sample was chosen the one half of the lamb carcass of 1 category, weight 21.4 kg, as a control, use the other half carcasses (Table 1).

Table 1
Output of individual cuts and waste

Number	Name of cuts	Output, kg	Percentage ratio, %
1	Ingredients: Zhauyryn - Front Leg (2 pieces): Front leg 1 Front leg 2	 4.21 2.01 2.19	 19.69 9.43 10.26
2	Zhambas - Rear Leg (2 pieces): Rear leg with shank 1 Rear leg without shank 2	6.47 3.25 3.22	30.24 15.18 15.06
3	Lumbar - Beldeme	1.275	5.96
4	Broad tail	1.45	6.78
5	Neck - Moiyn	1.14	5.33
6	Vertebrae	1.65	7.71
7	Loin - Sybe including: ribs - kabyrga	2.14 1.15	10.02 5.38
8	Asykty zhilik - the hock bone	0.82	3.84
9	brisket	0.575	2.70
10	Kidney with kidney fat	0.555	2.60
11	Meat cuts	0.84	3.94
12	Tendons and cartilage	0.08	0.32
13	Technical stripping and loss	0.185	0.87
	Total	21.395	100

The output of raw materials from carcasses 1 category for the shoulder (zhauyryn) was 16.69%, the back (zhambas) – 25.24%, lumbar (beldeme) - 5.96%, neck (moiyn) - 5.33%, brisket (sube) - 2.7%.

The output of raw materials from 1 category of fatness carcass for the shoulder (zhauyryn) was 19.69%, the back (zhambas) - 30.24%, lumbar (beldeme) - 5.96%, neck (moiyn) – 5.33 % sube - 10.02%. The next stage of the research was to determine the morphological structure of carcasses lamb 1 category chosen as the test samples parts (Tables 2 and 3).

The value of the meat determines by the chemical composition and biological value of muscle tissue, especially in protein and essential amino acids, and their ratio, balance that is compatible with other food substances. Table 3 shows the chemical composition of the fleshy parts, lamb cuts of 1 and 2 categories. Table 4 shows the amino acid composition of the raw materials used.

Discussion

The fleshy part of zhambas and sube is characterized by moderate content of the muscle surface layer of fat, and low content of connective tissue increases the culinary and nutritional advantages of these parts. In practice, unfortunately, beldeme and moiyn use only in public catering and in the home for cooking broth. This limits their culinary uses. These parts have a slightly higher content of bone tissue and less muscle, but the nutritional advantages in no way inferior in relation to other parts of the complex. Also, these parts are very interesting at the national level, as the respond to

Table 2
The morphological structure of test samples parts of carcasses lamb 1 category, in %

Name of a part	Muscle tissue	Fatty tissue	The bone tissue	Total
Zhambas	83.1	4.3	12.6	100.0
Sube	77.2	8.1	14.7	100.0
Beldeme	56.1	12.5	31.4	100.0
Moiyn	55.6	1.2	43.2	100.0

Table 3
Chemical composition of individual parts of lamb

Parts of the carcass	Chemical composition of fleshy parts and cuts of lamb			
	Moisture, %	Fat, %	Protein, %	Ash, %
Lamb of 1 category				
Zhambas (rear leg)	68.36	11.47	18.54	0.71
Zhauyryn (front leg)	68.06	12.77	17.44	0.69
Sube (loin)	70.45	8.58	18.97	0.72
Lamb of 2 category				
Zhambas (rear leg)	70.25	9.35	18.64	0.74
Zhauyryn (front leg)	69.42	11.77	17.16	0.67
Sube (loin)	70.68	9.48	8.43	0.70

Table 4
The amino acid composition of individual cuts of lamb

Amino acids	Amino acid composition of lamb cuts, g per 100 g of meat				
	zhambas	zhauyryn	moiyn	sube	beldeme
isoleucine	4.70	4.63	4.65	4.25	4.27
leucine	7.77	7.56	7.95	7.83	8.05
lysine	8.2	7.8	7.1	7.5	8.0
methionine + cystine	2.6	3.20	3.45	3.54	3.94
phenylalanine + tyrosine	7.65	7.78	7.81	7.93	7.50
threonine	4.70	4.5	4.2	4.43	4.5
tryptophan	1.8	1.6	1.7	1.8	1.6
valine	4.9	4.1	4.4	4.05	4.5

Kazakh traditions of supplying and lying of lamb carcasses on a platter as a traditional food (Lisitsin et al., 2007). By the organoleptic analysis, it was determined that the carcasses have well-developed muscles, bones appear not sharpand, fat deposits observed in the area of pelvic bones, in the outside of the thighs, in the abdominal wall, between the pelvic muscle groups, back, chest, moderate fat deposits are near the kidneys, in the presence of fat tail. Muscle color pale pink, fat - milky white. Muscle fibers are thin, the cut are small granular structure.

Consistency of muscle tissue elastic, fat - soft. According to the morphological structure it is determined that zhambas is more valuable part as it has more muscular tissue and moderate amount of adipose tissue in comparison with other parts of carcass (Kenzheahmetuly, 2005). It is determined in the comparative analysis of chemical composition of separate parts of lamb depending on category that the second category is characterized by larger moisture content, protein and ashes, and the smaller content of fat in comparison with first category.

The analysis of amino-acid composition of separate parts of the lamb is showed that in comparison with other parts a lysine the least contents in moiyn for 0.4 - 1.1%; methionine + cystine the least contents in zhambas for 0.6 - 1.34%; the most content of valine in zhambas for 0.85 - 0.4%.

Conclusion

Thus, the lamb is the most accessible and widely used raw meat in the Republic of Kazakhstan along with the high nutritional advantages has a high social context, which allows expansion of assortment of the national meat products and meat-culinary products with high quality features. Our proposed national type of butchery lamb - by particular parts (zhilikteu), is more effective way of using raw materials for processing, as it allows to efficiently processing the carcass to produce finished meat products.

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