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FOOD VALUE OF YOUNG BUFFALOES CHILLED MEAT

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SUMMARY

The food value of young buffaloes (at the age of 30 months) chilled meat of an average finish has been studied. It has been found that food value of an eye muscle of loin and that of a chuck differs in the content of proteins, fats and their correlation, protein qualitative level and calorificity. The content of essential amino acids such as phenyl-alanine, lysine, valine, threonine, leucine and tryptophan is greater in the proteins of the eye muscle of loin than that in the chuck proteins. The study of speed and degree of meat proteins digestion showed that the amounts of products of proteolysis increase considerably under the pepsin influence. Subsequently the increase of the amounts of proteolysis products is inconsiderable.

Thus the food value of young buffaloes chilled meat is determined not only by its chemical and amino acid content but also by the speed of this process.

INTRODUCTION

The most significant characteristics of food value are its physico-chemical and biochemical qualities depending on the structural peculiarities of proteins and other biopolymeric compounds, their ability to be attacked by enzymes and to be digested. Nowadays a high calorificity of products not be the main criteria of their usefulness (1-3,6). In this connection we should expect the different degree of chilled meat proteins attacking.

Considerable variations of chemical and amino acid content, food value and the lack of data about the attacking degree of young buffaloes chilled meat by the gastrointestinal tract enzymes were the main basis for the investigation.

The objective of this work is to define the food value, amino acid compound, the degree and speed of buffaloes meat digestion by gastrointestinal tract enzymes. The subject of this investigation was the chilled meat of 30 months old buffalo (average-finished)

MATERIALS AND METHODS

Samples of chuck and eye muscle of loin were packed under vacuum in polymeric film Saran type (poviden) and stored for 5 days in the refrigerator at 0° + 4°C and  $\psi$  85-90%. The total content of moisture, proteins, fats, ashes, pH, tryptophan and hydroxy-proline was determined according to generally accepted method (4). Amino acid content of samples was investigated with the help of amino acid automatic analyser of AAA-881 type (CzSSR). Meat proteins attacking by proteolytic enzymes of pepsin-trypsin-chymotrypsin

system in vitro was determined by method(5).

RESULTS AND DISCUSSION

It has been found that food value of different samples differs by the content of proteins, fat and by their correlation and by their calorificity (table 1).

Table 1. Total chemical composition and food value of buffalo meat.

Indices, %	Samples	
	Chuck	Eye muscle of loin
Moisture	66,10	66,28
Protein	19,67	20,35
Fat	13,17	12,35
Ash	1,06	1,02
pH	5,68	5,72
Protein-fat correlation	1,49	1,64
Tryptophan hydroxyproline correlation	0,56	0,74
Caloricity, kgj	1402,22	1562,24

Protein qualitative index (PQI) is the important index of quality and food value. This index is the correlation of tryptophan to hydroxyproline. For eye muscle of loin the protein qualitative index was - 0,74, for chuck - 0,56. According to the amino acid composition data (table 2) the content of indispensable amino acids such as phenyl-alanine, lysine, valine, threonine, leucine and tryptophan is greater in the eyes muscle of loin proteins than that in the chuck proteins. The content of amino acids such as histidine, alanine, tyrosine and hydroxyproline is greater in chuck proteins than that in the eye muscle of loin proteins. Obviously the content and correlation of proteins, fats and proteins qualitative index of meat are responsible for its food value.

Table 2. The amino acid composition of different buffalo meat samples (g/100 g meat)

Amino acid items	Amino acid content	
	Chuck	Eye muscle of loin
Phenyl-alanine	1,485	1,625
Methionine	0,415	0,375
Lysine	1,362	1,383
Valine	1,538	1,631
Threonine	0,748	0,792
Tryptophan	0,195	0,215
Leucine	1,389	1,469
Isoleucine	0,843	0,867
Histidine	0,649	0,443
Arginine	0,978	1,015
Asparaginic acid	1,739	1,746
Serine	0,782	0,832
Proline	0,895	0,961
Glycine	0,831	0,877
Alanine	1,101	1,039
Cystine	0,275	0,348
Tyrosine	0,794	0,786
Glutamic acid	3,297	3,362
Hydroxy-proline	0,345	0,290

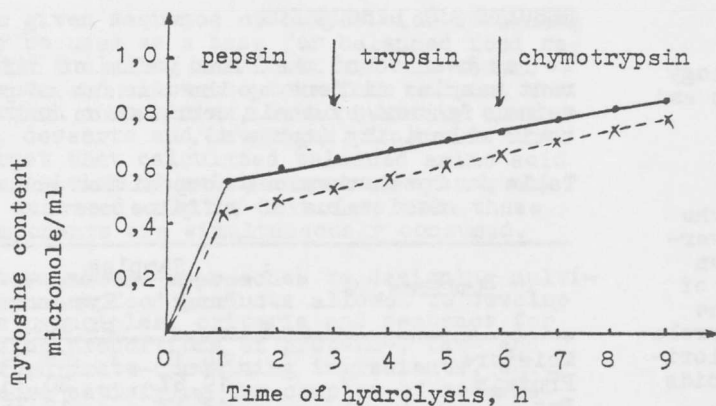


Fig. Proteins attacking of buffaloes chilled meat:

- 1 - eye muscle of loin;  
2 - chuck.

The results on the speed study and the degree of meat proteins digestion are shown in the figure (The arrow shows the time of enzyme change). In the figure you can see that considerable quantity of proteolysis products (88,8%) increase under the pepsin influence on the eye muscle of loin protein (curve 1), a little bit slower (83%) in chuck proteins (curve 2). Further increase of hydrolysis products is insignificant. Obviously on the basis of modern biochemical conceptions the proteolysis of aged meat is due to gradual decomposition of end low molecular hydrolysis products from protein molecule with saving (on first stage) of high molecular residue which is then digested. Subsequently, reduction of enzymatic availability of proteins is due possibly to conformational changes in protein molecule structure. These changes in the structure are due to the reaction of chemical interaction with lipids and carbohydrates and result in the formation of compounds not decomposed by pepsin. The addition of trypsin and chymotrypsin accelerates to some extent proteolysis, the laws of samples digestion being served. Less speed and less degree of chuck proteins digestion may be explained by large content of connective tissue proteins.

On the basis of the study of chemical and amino acid compound, protein qualitative index, the protein attacking degree and speed we can draw a conclusion that food value of the eye muscle of loin is higher than that of a chuck. The digestion of meat proteins is the important index of their food value due to its connection with the digestibility. The data obtained in the result of experiment can be used for better choice and grounds of more rational usage of investigating buffalo meat samples.

#### LITERATURE

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