PRODUCTION OF SPECIAL PRODUCTS ON THE BASIS OF SECONDARY MEAT AND PLANT RAW MATERIALS

Ludmila Antipova, Elena Kurchaeva, Oleg Osminin

Voronezh State Technological Academy, pr-t Revolutsii, 19, 394017 Voronezh, Russia

Key words: lentil, lentil protein isolate, paste, biological value of pastes.

Introduction

Biologically complete products on the basic of meat and plant raw materials play the importance role in the organization of children rational diet. Of large importance is the proteinaceous part of the diet because proteins are necessary for children because they supply energy, build and repair tissues, and regulate body processes. When meat is taken into the body with some plant components, the assimilation of vegetable and cereal iron is ensured due to bounding of free ions of the iron with sulphydrye groups of cysteine of meat proteins.

Among plant sources for combining proteinaceous systems, the leguminous cullture –lentil has the perspective. The level of assimilation and food value of lentil is similar to meat ones. Lentil protein is the source of important, for the body, amino acids and first of all lysyne essential for children body.

Biological value of a final product increases due to mutual enrichment by the essential amino acids.

Many technical solutions are based on the use of meat raw materials with the combination of cheap and highly functional plant preparations due to this effect of mutual enrichment.

Objects

We used in our experimental study: beef liver, the second grade beef, blood fractions as cattle (plasma and formed elements) and plant preparations of proteins: lentil protein isolate and powdery milk –vegetable half-finished products.

Methods

Mass share of moisture was determined by the method [5]. Mass share of fat was determined by the method [5]. Mass share of ash by the method [5]. Mass share of protein – by the method of Kjeldahl [5]. Amino acid content of protein products was determined by the method of ion-exchange chromatography on the automatic ion analyzer AAA-881. Biological value of new products was estimated by the use of amino acid scor determined with the help of calculations. The quality of ready-made products was determined according to the existing standards, organoleptic indices by [5].

Results and discussion

At the development of new kinds of pastes, much attention is paid to their appearance, because it is connected with the perception of food by children.

Lentil protein isolate (LPI) was added instead of blanched beef liver. Besides we chose the conditions of LPI hydration. The range studied: 1:1, 1:2, 1:4. Paste formulation have been chosen taking into account functional properties of meat raw material and hydration of LPI.

Pastes obtained show that the products are characterized by the prevailing content of the protein due to the use of LPI containing 93-96% of protein and characterized by non-high caloricity.

For determination of biological value of pastes, the important indice is the qualitative ratio of essential amino acids. From tab.1 we can see that products meet the needs of children organisms and even exceed the known samples.

Potential possibilities of pastes in meeting the children demands in vitamins and minerals are shown in tab.2 and 3.

Thus, from the data developed pastes meet the children body demands in vitamins A and B_{12}, traces of elements Fe, Co, Cu and in this connection, this product can be recommended for children diet which are ill due to the lack of vitamins in the body.

Besides, the high content in the product allows to prevent anemia and to give disease- preventive properties to the product.

Conclusion

1. Pastes obtained are well balanced according tj their content. Protein is essential because it is not limited according to the essential aminoacids. Low content of fat in the product and the presence of vitamins and minerals give the product the disease-preventive properties.

2. Pastes developed exceed milk of cattle, beef of the first grade and are similar to ideal proteinous systems according to such indices as biological value, utility coefficient and digestibility by gastric enzymes.

References

1. Deryugina M. P. et. al. Children diet / Minsk: "Polimea", 1991.-415 p.

2. Energy and protein demands: report of experts of consulting meeting unity FAO/VOZ and UON.-M.: "Midicine", 1987.-20 p.

3. Astanina V.Yu. Application of lentil protein preparation in technology of meat and meat products. Dissertation.- speciality 05.18.04. Technology of meat, milk and fish products / VSTA.- Voronezh, 1999.-22 p.

4. Lipatov N.N. Teoretical premises of computer designing of products and diets with the given food value // storage and processing of agricultural raw materials. - № 3. – p. 4-9.

5. Zhuravskaya N.K., Alehina L.I., Otryashenkova L.M. Study and control of meat and meat products quality. M.: Agropromizdat, 1985. – 296 p.

Table 1

Amino acide	Protein by FAO/VOZ	Norm for children, age 7-10 years, mg/1 kg	Norm for children, age 11-14 years, mg/1 kg	Pastes		
				Gavrusha, mg/g protein	Cat Motroskin, mg/g protein	Ancle Phedor, mg/g protein
Val	50	45,5	43,12	59,6	60,1	59,4
Ile	40	41,38	43,12	48,49	45,4	45,9
leu	70	62,08	60,38	83,7	83,5	82,7
lys	55	82,76	51,75	74,76	75,3	62,1
Met+cys	35	37,24	56,064	36,1	35,8	35,9
Thr	40	48,28	30,19	41,14	42,4	40,6
Trp	10	5,52	15,095	13,16	13,1	12,8
Phe	60	37,24	60,38	84,2	80,1	81,6

Table 2

Names of vitamin	Norm for children, age 7-10 years	Norm for children, age 11-14 years	Pastes		
			Gavrusha	Cat Motroskin	Ancle Phedor
A, mg	0,4	0,575	2,95	2,95	2,95
D, mkg	2,5	2,5	0,8	0,8	0,8
B_1, mg	0,9	1,0	0,194	0,199	0,194
B_2, mg	1,3	1,6	1,27	1,28	1,27
B_{12}, mkg	1,5	2,0	14,66	14,66	14,66
Niacin, mg	14,5	19,2	5,22	5,22	5,22
Folic acid, mkg	100	100	3,24	3,24	3,24
C, mg	20	20	6,15	6,15	6,15

Table 3

Minerals	Norm for children, age 7-10 years	Norm for children, age 11-14 years	Pastes		
			Gavrusha	Cat Motroskin	Ancle Phedor
Macroelements, mg:					
K	2000-3000	2000-3000	133	133	133.4
Mg	0,25	0,25	10,6	10,8	10,9
Ca	600-700	400-500	4,82	4,86	4,88
P	1000-1520	1000-1520	149	149	149
Iraces of elements, mkg					
Fe	5000-10000	9000-18000	27300	27300	28100
Co	1,5	2,5	6,2	6,2	6,2
Mn	-	-	114,2	114,2	114,6
Cu	40	-	1236,4	1236,4	1236,4
Mo	56	73	35,12	35,12	35,12
Zn	16000	16000	2248	2269	2251