DIETETIC PROPERTIES OF MEAT PRODUCTS FOR CHILDREN´S DIETARY AND THE PURPOSEFUL CORRECTION OF THESE PROPERTIES

A. V. Ustinova, E. G. Bobrikova, N. E. Belyakina, All-Russian Meat Research Institute, Talalikhina 26, 109316, Moscow, Russia
T. E. Borovik, Institute of Nutrition, Russian Academy of Medical Sciences, Ustyinsky proyezd 2/14, 107240, Moscow, Russia
N. V. Timoshenko, Tikhoretsk Meat Processing Plant, ul. Udarnikov 14, Tikhoretsk, Krasnodar region, Russia

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The number of children suffering from the allergy to the cow´s milk, beef, and other products with specific antigenic affinity of proteins considerably increased. In this connection a need arose to analyze potentials of using some types of meat raw materials of high biological value and with high content of assimilable iron. Such products as livers, spleens, tongues, and blood from slaughtered animals have quite the same chemical and biological value as the beef has. Moreover these products contain higher levels of essential aminoacids, polyunsaturated fatty acids, trace elements, and vitamins.
The aim of the present study was to ground the selection of a protein component for a curative product for babies of the first six months life, suffering from increased sensitivitty to cow´s milk proteins, as based on studies of its allergic properties.
In experiments guinea-pigs were used. Animals received rations containing preserved pork and horse-meat with or without isolated soy protein added. Preserved meat products were developed in accordance with formalized medico-biological rules which limited the contents of main macronutrients with special consideration of the chemical composition of preheated meat raw material. Method of linear programming was used to approximate in maximum degree the recipe of new product (made of pork and horse-meat) to the composition of mother´s milk as far as the contents of protein and fat were concerned.
In the first series of experiments, the effect of preserved meats on the stability of experimental animals (guinea-pigs) to the sensibilizing action of the allergic food product pattern - pasteurized whole cow milk - was analyzed (PWCM) (Table 1).

Table 1

Effect of preserved meat on guinea-pigs stability to allergic factors and their resistance to average fatal dose of histamine

Nos	Animal feed rations	Number of animals	Degree of feed anaphylaxis			Histamine shock	
			lethality, %	convulsions, %	anaphylaxis index	Number of animals	%
1	Preserved pork	18	30	50	2. 15	8	44. 4
2	Preserved pork with Ardex F soy protein	17	40	50	2. 25	12	70. 6
3	Presreved pork with Ardex FS soy protein	17	67	67	3. 0	11	64. 7
4	Standard ration	16	44	67	2. 89	8	50. 0

It was found that preserved pork and preserved pork with Ardex F soy protein isolate had hypoallergic effect as compared to the standard ration. However preserved pork with Ardex FS modified soy protein isolate intensified allergic properties of pasteurized whole cow milk.
In the second series of experiments, the effect of preserved meats on guinea-pigs resistance to average fatal dose of histamine (ЛД50) was analyzed . Results summarized in Tab. 1 demonstrated that preserved meats without additives insignificantly decreased the sensitivity of animals to histamine (ЛД50). With Ardex F and Ardex FS soy protein isolates added, animals tolerance to histamine (ЛД50) evidently decreased.
Thus, preserved pork without soy protein had the highest hypoallergic effect - promoted decrease of anaphylactic sensitivity, did not decrease tolerance of the animals to LD 50 of histamine, and as a result can be recommended for child and dietetic nutrition specifically for patients with food intolerance.
Medicinal products made on the basis of horse-meat proteins were clinically tested at the Scientific Reseach Institute of Pediatrics (Russian Academy of Medical Science).
2-6 month babies were involved in the experiment. All patients had skin and gastro-intestinal manifestations of food allergy, hypotrophy (1-2 degree), severe coeliac disease combined with hypotrophy of 1-2 degree.
As meat product was used, sufficient decrease of antibody titres to milk proteins (MP)

and soy proteins (SP) in patients suffered from food allergy was noted and to milk proteins and gluten (Gl) in children suffered from coeliac disease (see Fig. 1).

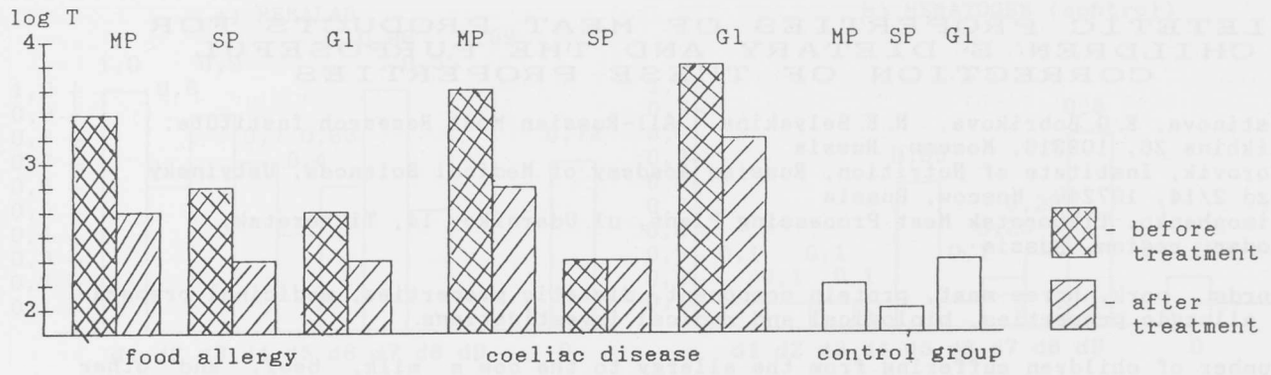

Fig. 1 Dynamics of antibody titres to food antigenes of patients with food intolerance when dietetic therapy was used.

Comparative evaluation of the medicinal meat product and soy mixes made abroad and in Russia showed that a product based on meat protein not only rendered similar therapeutic effect to patients suffered from coeliac disease and food allergy, but had no negative effects. In this connection new meat protein product could be recommended for dietetic nutrition of babies in first six months of life, if they suffered from food intolerance (allergy to milk and soy proteins, and gluten). It could be used also as a mother's milk substitute. Using this meat protein product made it possible to eliminate symptoms of food allergy and dyspepsia, to normalize nutritive status of babies.
Results of studies demonstrated the higher medicinal effect of preserved horse-meat and pork supplemented with 2.0 - 4.0 % of soy protein isolate (made in varions firms) combined with oil (3.0 - 5.0 %), bone preparation (0.5 - 0.7 %), potassium and magnesium salts, vitamins A and E (Tab. 2)

Table 2

Results of medico-biological evaluation of preserved pork and horse-meat

Indices	Pork puree	Horse-meat puree	Enriched puree composition	
			pork	horse-meat
Protein efficiency factor (PEF)	2,98(0,31)	2,79(0,27)	3,31(0,27)	3,27(0,39)
Net utilization of protein (NUP), %	75,23(1,44)	74,80(1,72)	77,80(1,37)	77,28(1,28)
Assimilability (A), %	96,70(1,24)	95,60(1,40)	97,82(1,30)	97,60(1,00)
Weight of tibia, mg	405,00(29,0)	467,00(41,2)	484,00(45,0)	500,00(37,0)
Ash of bone (in wet bone mass), %	40,20(0,47)	40,80(0,53)	44,50(0,21)	43,11(0,18)
Assimilability of Ca, %	63,00(2,18)	64,21(3,49)	72,00(3,57)	71,00(2,95)
Cholesterol content in blood plasma, mg%	6,95(3,81)	80,31(4,08)	75,30(3,47)	70,08(2,93)

Clinical studies carried out by specialists of the Institute of Pediatrics confirmed the high medicinal effect of preserved horse-meat and pork on babies with abnormal sensitivity to cow milk proteins. New preserved meat products have the following characteristics:
- render considerable effect on the growth of babies, because these products contain combinations of proteins, fats and oils enriched with mineral substanees and vitamins;
- have anti-inflammatory effect;
- strengthen the connective tissue;
- improve blood supply to tissues;
- decrease vascular permeability of the skin and of mucous membrane within the stomach;
- promote the bone formation.

Nowadays a great number of babies suffered from anemia was registered.
It was established that preserved meats supplemented by liver, spleen or blood of slaughtered animals increased the hemoglobine level in blood of experimental animals. Clinical trials enveloped children and grown-ups suffering from anemia and confirmed the therapeutic efficiency of new preserved meat products.

Conclusions.

Results of medico-biological studies in lab and trials in clinical conditions demonstrated with confidence:

- hypoallergic effect of pork and horse-meat; new preserved meat products did not render negative effect on babies (after 2 month of life) suffering from intolerance to many nutritions foods , and could be recommended as mother´s milk substitute;
- potentialities for aimed correction of consumer properties by supplementing new preserved meat product with various (protein, fat, oil, minerals, and vitamins) ingredients, which promoted the connective tissue strengthening, bone formation, improved blood supply to tissues, decrease vascular permeability of the skin and of mucous membrane of the intesties;
- therapeutic efficiency of preserved meat products containing liver, spleen or blood of slaughtered animals for children and grown-ups suffering from anemia.