

DEVELOPMENT OF PRODUCTS FOR CHILD NUTRITION FROM MEAT OF PIGS RAISED ON NEW FOOD ADDITIVES

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Background

The concept of state policy in healthy nutrition of population of Russia up to 2005, based on the decisions of the UN Conference (Rio de Janeiro, Brazil, 1992) and International Conference on Nutrition (Rome, Italy, 1992), points to the necessity of supply of population, including children, with foodstuffs favouring their normal growth and maturation.

Physiological protein requirements of children, especially in early age, are considerably higher, than those of a grown-up person, that's why both meat and dairy products hold a special place in their nutrition.

Medical and biological requirements to canned meat for nutrition of infants strictly normalize indices of food and biological value of such products, as well as availability of harmful chemical substances in them, what is connected with peculiar sensitivity of the child's organism to the influence of unfavourable factors. In this connection, special requirements ensuring the output of ecologically clean production, of high biological value and good taste quality, are made to meat raw material used in manufacture of such products.

Meat of pigs, whose food value is determined, first of all, by a high content of valuable proteins in it, is one of the main kinds of meat raw materials used for production of canned meat for child nutrition.

Pork meat favourably differs in its aminoacid composition of proteins, in which higher than usual content of arginine, lysine, tryptophan, valine, isoleucine and leucine, as well as phenylalanine is registered. Pork meat, compared to beef meat, has a higher content of vitamins, in particular, those of group B. It is retained in the stomach for a longer period of time and so has a higher coefficient of usage in anabolism (in comparison with beef meat, by 15 %). Pork fat is better assimilated and contains more polyunsaturated acids, than beef and mutton fat. Due to it, industrial importance of pork meat is determined by the content of both muscular and fat tissues.

As the experience with the plant of canned meat for children at "Tikhoretsky" meat-packing plant showed, it was impossible to obtain raw material of the required quality without creation of specialized stock zones, including specialized stock farms, where the quality control of the used forages, observance of the higher than usual veterinary and sanitary rules of cattle raising and fattening, as well as the possibility of application of special fattening procedures permitting to directionally influence the chemical composition of meat with the aim of its usage in child and curative-and-preventive nutrition, can be provided.

Objective

Studying the possibility of utilization of meat of pigs raised on new food additives in foods for child nutrition.

To fulfil the set task, it is necessary to investigate the food, biological, technological, and toxicological value of pork meat, obtained with the use of special fattening.

Object and Methods

Meat raw material - trimmed pork meat from animals aged 7 months, breed "Krupnaya belaya", raised on high-protein food additives at Gosplemzavod (State pedigreed stock farm) "Gulkevichsky" in Krasnodar Region.

Results and their Discussion

The rice husk was used as a new high-protein food additive. The control group was fattened on the basis of meat-bone powder, and the test one, with the use of rice husk additive in their ration. After fattening the weight of test animals was, on an average, near 114 kg and exceeded that of control animals by 11.2 %.

Boning and trimming were done according to the scheme adopted for child nutrition products: non-fat, semi-fat, fat, lard, breast by separation of bones, technical trimmings, sinews, and cartilages. For production of canned foods for child nutrition trimmed meat with 13-17 % fat content was used.

The quality of trimmed meat of animals from test groups, according to water-binding capacity and protein content turned out to be better than that of animals from the control group. The water-binding capacity was, on an average, by 0.32 % higher in the test group, as compared with the control; the content of protein was higher by 1 %, respectively. Meat of test animals also had better indices, such as content of tryptophan, hydroxyproline, and the protein quality index. Proteins of the samples under investigation had a full-value aminoacid composition; however, by the sum of replaceable and irreplaceable aminoacids the sample of meat from animals of the test group which exceeded the control one by 4.49 %, was the best. Meat of test animals was characterized by aroma, taste, tenderness and juiciness. The carried out expanded tasting confirmed the data on high taste and organoleptic properties of meat from test animals. Investigations on digestibility of meat revealed the best digestive ability of meat from animals of the test group.

During trimming of pork meat according to the scheme for child nutrition, excess yields of the test group, with reference to the control, by fat grades were discovered, what confirmed the advisability of more early removal of pigs raised on new rations from fattening. The canned food manufactured from this raw material met the requirements made on the products for child nutrition by toxicological, chemical and organoleptic properties (see Table below).

Conclusion

Results of investigations of canned foods for digestibility, as well as other data, testify in favour of canned foods obtained from meat of animals of test groups, what permits to make a conclusion about the outlook of use of pigs raised with utilization of high-protein food additives in manufacture of products for child nutrition.

Indices	Non-fat pork		Canned food	
	control group	test group	control group	test group
Moisture, %	61.0±0.6	59.2±0.8	17.4±0.5	21.0±0.5
Protein, %	14.9±0.7	17.6±0.6	9.5±0.4	10.22±0.4
Fat, %	25.5±0.5	19.6±0.7	10.1±0.5	6.1±0.5
Ph	6.2±0.7	6.0±0.6	-	-
Safety indices:				
mercury	not discovered	not discovered	not discovered	not discovered
cadmium	0.003±0.0005	not discovered	not discovered	0.01±0.0005
arsenic	not discovered	0.17±0.0006	not discovered	not discovered
lead	0.20±0.0006	not discovered	0.13±0.0005	0.15±0.0011
copper	0.88±0.00012	0.50±0.0007	0.38±0.0006	0.58±0.0006
zinc	13.6±0.2	22.12±0.002	18.51±0.0012	20.91±0.5
organochloric pesticides	not discovered	not discovered	not discovered	not discovered

References

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