

## FEEDSTUFFS AS PRODUCED ON THE BASIS OF INEDIBLE RAW MATERIALS

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The development of balanced feedstuffs of full value which the most completely satisfy the requirements of animals in nutrients and biologically active substances (proteins, fats, carbohydrates, macro- and microelements, vitamins, amino acids, etc.) refers to the number of the most important problems confronting the agriculture of Russia. For their solving in many countries attempts are made to use rationally by-products of the food industry, e.g. residues of mill, oil extraction, starch, sugar and other industries, in the manufacture of feedstuffs. However, many non-traditional sources of inedible raw materials don't find yet a practical use in the production of feedstuffs are used rather insufficiently.

The present report includes results of experimental studies on the development of multi-component feedstuffs based on large-volume wastes of meat (fleshy inedible raw materials, bone), woodworking (acid hydrolyzed sawdust), brewing (brewers' grains) industries as well as acid enzyme hydrolyzed blood proteins.

Three formulations of feedstuffs were developed by using the mathematical methods for planning experiments, those feedstuffs differing in quantitative content of components above-named. New formulations were approved first in laboratory and after that in industrial conditions. The quality estimation of these feedstuffs was carried out according to generally accepted physico-chemical methods of analysis (Table 1).

No. of formulation	Content of (%)						pH
	water	fat	ash	protein	fibres		
I	2,15	18,5	33,6	34,15	3,75		
II	1,82	19,7	29,8	33,75	6,70		
III	4,40	15,53	30,70	39,5	4,20		

Studies on the amino acid composition of proteins of feedstuffs produced showed that they contained all the non-essential and essential amino acids. Feedstuffs produced proved to be rather safe in veterinary-sanitary respect: the content of heavy metals in them didn't exceed permissible level.

It is important to emphasize that changes in the chemical composition of feedstuffs in one or another side can be achieved, in case of need, by decreasing or increasing the content of ingredients these products contain. Thus, when increasing a mass portion of hydrolyzed blood in formulation III up to 30 %, the protein content of a product increases to 51,5 %.

Furthermore, physico-chemical characteristics of feedstuffs are very influenced by the moisture content of additives to be introduced in them. When using, e.g., pressed and dried by the different methods brewers' grains, up to 15 % of sugars and amino acids is lost; a part of protein substances is converted into an indigestible form and becomes hardly water-soluble one. It leads to decreasing a nutritive value of feedstuffs.

Studies carried out in critical experiments on 8-week old rats and aimed at clearing up, whether feedstuffs produced are harmless or not haven't revealed the death or the appearance of any extraneous or toxic phenomena. No deviations in behaviour-reactions of animals were observed. External and internal examination of their internal organs (heart, liver, kidney, spleen) after slaughtering hasn't revealed any deviations from the norm. It allowed to conclude that feedstuffs studied were non-toxic ones.

In chronic experiments on non-pedigreed male rats which were fed with mixed feeds under study for three weeks a high eating quality of these feeds and a progressive gain in weight of experimental animals were noticed as compared with control ones which were fed a standard vivarium ration (Table 2) what indicates of a growth-improving activity of these feedstuffs.

It can be believed that a growth-stimulating effect to be observed and a high feeding value of new kinds of feedstuffs are the result of the presence in them of not only meat fleshy raw materials but also products of the degradation of cellulose molecules being formed during hydrolysis of sawdust (D-glucose, in particular), B complex vitamins, calcium and magnesium salts and other biologically active substances which brewers' grains contain as well as free essential amino acids which hydrolyzed blood contains.

No. of formulation	Mean initial body mass of rats in a group, g	Body mass of rats (g) when feeding during			Weight gain of body mass of rats (g) in:			Final weight gain of body mass of rats %
		1 week	2 weeks	3 weeks	1 week	2 weeks	3 weeks	
I	122,0	139	161	176	17	39	54	144,26
II	123,0	142	164	179	19	41	56	145,52
III	122,0	152	174	194	30	52	72	159,0
IV (control)	123,0	140	155	158	17	32	35	128,45

