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**FORMULAE OF FEED FOR LAMBS ON THE BASIS
OF FEED SUPPLEMENTS**

Созданы рецепты комбикормов для ягнят на основе новой кормовой добавки из отходов крахмалопаточных и масложировых производств

Ключевые слова: комбикорм, кормовые добавки, ягнята, отходы



Жұмыстың мақсаты жас қозыларға крахмал сірнесінің және май өнімдерінің қалдықтарын қоса отырып, жаңа құрама жем рецептісін дайындау болып табылады.

Кілт сөздер: құрама жем, жем қоспалары, қозылар, қалдықтар.



The task was to create a formula of combined feeds for lambs on the basis of a new feed additive made of wastes of oil and fat and starch production.

Key words: combined feeds, feed additives, lambs, wastes.

To make the formula with the introduction of feed additives we used the existing state standards, the planned formula, guidelines on the calculation, national recommendations on forage production, which are used in the feed industry and guides to the feeding of farm animals. The decision of the problem, challenged by the animal feed industry, requires a search for new sources of raw materials, creating a variety of feed additives based on them, and thereby expand the resource base and improve the quality of animal feed products.

Food industry is traditionally focused on the production of a basic product combined feed, the output of which is 15 to 30% of feedstock mass. The remaining portion contains a considerable amount of

valuable and useful substances is not used in the production process, goes to the so-called production waste, a certain proportion that may be used for the production of fodder and fodder mixtures. Wastes of food businesses can be divided into the following groups:

Return wastes, which are returned to the main proceedings;

Unused wastes are production wastes with no established possibility and expediency of immediate use which due to the present level of development of science and technology;

Used wastes are wastes that may be implemented as raw materials or additives thereto in the manufacture of a new product.

Wastes of starch and fat industry (corn and wheat corcules, corn gluten, corn bran, phosphatide concentrate, soybean meal, wheat bran) relate to the Used Waste group. In conducting research our task was to develop a method for producing a feed additive from waste oil and fat production and starch-containing lactic acid bacteria in the technological and stable form, i.e., the physico-chemical composition and nutritional value of the components. The material of the study were corn gluten, corn corcules (dry), corn bran, phosphatide concentrate, the probiotic drug "Biokons", salt, chalk, premix.

Corn gluten is a valuable product obtained during the processing of maize for starch and molasses. It is a pure protein and has excellent nutritional properties. Corn gluten is widely used in the production of compound feed not only because of its high nutritional value, but also for its good physical characteristics.

Corn Corcule is a by-product which is obtained by processing corn starch or grits, constituting 8 to 14% by weight of corn grain. This accounting for over 80% of the fat contained in corn, about 20% protein, 74% of mineral substances. In composition, corn corcule is rich in unsaturated fatty acids (linoleic, oleic). The protein part of it contains more than 50% of glutelin, 37% of globulin, 7% of insoluble fats. Furthermore, corn corcule is noted by its high content of vitamin E, A, F, phytin, beta sitostirona, and amino acids [1].

This composition results in the area of application of the product, namely the production of mixed feeds for animals and poultry. It contains proteins, fats, minerals and well absorbed by the digestive system and normalizes metabolism. Furthermore, corn corcule is used

for production of corn oil, margarine and gluten.

Corn bran is used in the feeding of farm animals, both directly and for the preparation of animal feed as a substitute for whole corn. Corn bran contains 18 to 24% of protein, and also, fiber; exchange energy is 13.2 MJ, humidity - 12% [2].

Phosphatide concentrate is produced in the primary cleaning of oils and seeds. Phosphatides similar to fats, but unlike former they contain phosphoric acid, and the associated nitrogen compound choline, which is involved in the synthesis of essential amino acids and regulates lipid metabolism. Phosphatides are produced in large quantities. The output of phosphatide concentrate contains 1% of the amount of oil subjected to hydration.

The main reason for the limited and poor use of phosphatides is that they are at their physical state they are thick pasty liquid that changes its technical properties, depending on the ambient temperature. This makes them difficult to transport and use efficiently for feed production: difficulties of feeding on a special line to input liquid components, inaccurate dosing, and poor mixing with the other feed components, which are bulk materials.

In view of the above said we have a problem of processing phosphatidic concentrates in a technological and stable shape corresponding to the modern industry of feed. Despite the large volumes of phosphatide concentrate, soap-stock lipids and high concentrations of fats and vitamins in them, they are used incompletely and ineffective as there is no effective system and the technology for their use.

Currently, the market places demands high quality feeds. The implementation of these requirements is possible through enriching the feed (attracting new feed additives) and use of special technologies changing the structural, mechanical and biochemical properties of the product.

The probiotic drug "Biokons" is a microbial mass of live, antagonistically active lactic acid bacteria strains. It possesses high antagonistic properties against pathogenic microorganisms in comparison with monocultures. Input of the "Biokons", containing lactic acid bacteria in the feed additive for various age groups of sheep, is 0.03%.

Employed group of wastes containing animal and vegetable protein, fiber, dietary fiber, as well as biologically active substances have been partially used in the production of animal feed. However, there are large reserves of these wastes in food businesses, which are still unclaimed by virtue of their physical condition (high humidity), low nutrient density (table 1). On the basis of chemical composition and nutritional value of raw materials and wastes 3 formulas of feed additives for Lambs were developed (table 2).

Nutritional and chemical composition of the feed additive is due to the obtained set and component ratio based on corn and wheat corcules, corn gluten, corn bran, phosphatide concentrate, soybean meal, wheat bran, i.e. formula. Analysis of the chemical composition and nutritional value of feed additives suggest that they are a source of protein, energy, and mineral and the adopted technology resulted in obtaining of a new product (table 3).

The main indicator of high-quality animal feed is the suitability in accordance with the needs of the animals in essential food factors. Compliance with this provision provides high conversion in the production of animal feed. Therefore, along with the expansion of food supply from traditional forms of food it is evident that there is a need in enhanced use of non-conventional feed resources, especially of natural origin. Thus, the fat and oil industry, processing plant material, is a major supplier of concentrated protein feed. In addition, as fat-containing products, this industry can deliver phosphatide concentrates and protein feeds.

The production of corn starch and corn syrup generates wastes (corn gluten, corn corcules, corn bran). On the basis they produce feeds, which in pure form is not satisfactory by its nutritional requirements of feeding farm animals.

Corn grain is the basic starchy raw material used to produce starch, starch syrup, glucose, as well as byproducts of gluten (corn protein, corn oil and waste feed, such as bran, hulling barn, cakes, corcules). The greatest interest for feed production is corn gluten, corn corcules, corn bran, waste products with a high content of protein and fat.

According to the standard input of raw materials and feed additives made of waste of starch and fat-oil industries into feeds we

Table 1

The chemical composition of raw materials and waste starch and fat-oil production facilities used in the production of animal feed and feed additives for various age groups of sheep

Component	Content. %											
	Moist	Crude Protein	Crude fat	Crude Fiber	Calcium	Phosphorus	Sodium	Crude Ash	Lysine	Methionine	Tryptophan	Methionine+cystine
Corn (maize)	12.2	9.0	4.0	2.2	0.03	0.25	0.03	1.3	0.29	0.16	0.08	0.29
Barley	11.8	11.0	2.2	5.5	0.06	0.34	0.04	2.4	0.44	0.18	0.13	0.39
Feed wheat	12.1	11.5	2.2	2.7	0.04	0.30	0.02	1.6	0.39	0.20	0.16	0.41
Oat	11.6	11.5	4.5	10.3	0.12	0.35	0.04	3.0	0.38	0.14	0.15	0.34
Bran												
Wheat	11.5	15.0	4.2	9.0	0.14	1.0	0.04	4.5	0.57	0.19	0.21	0.41
Wheaten corcule	9.7	29.9	10.9	3.3	0.59	0.89	0.04	5.6	1.38	0.36	0.22	0.67
Corn (maize) corcule	9.6	11.9	14.5	6.5	0.52	0.73	0.04	5.0	0.96	0.26	0.22	0.56
Corn (maize) Gluten	10.0	44.8	4.8	5.2	0.12	0.05	-	-	-	-	-	-
Corn (maize) feed	11.4	16.4	4.3	8.6	0.28	0.62	0.14	3.8	0.56	0.30	0.15	0.58
Phosphatide concentrate	0.27	16.0	46.18	0.7	0.42	1.07	0.06	5.6	1.19	0.39	0.21	0.69

Table 2

Formulae of feed additive for lambs

Component	Experimental		
	No. 1	No. 2	No. 3
Corn (Maize) bran	34,0	–	34,0
Corn (Maize) Gluten	17,0	–	7,0
Corn (Maize) corcule	6,0	–	1,0
Wheat corcule	6,97	15,0	1,0
Phosphatide concentrate	–	5,0	1,0
Wheat bran	25,0	40,0	35,0
Soybean meal	–	15,0	–
Cotton plant protein meal	–	–	10,0
Sunflower protein meal	–	14,0	–
Chalk	5,0	5,0	5,0
Salt	5,0	5,0	5,0
Premix	1,0	1,0	1,0
Therapeutic and prophylactic drug "Biokons"	0,03	–	–
Total	100,0	100,0	100,0

Table 3

Nutrients and energy content of the feed additive for offspring lambs

Nutritional Indicators	Experimental		
	No. 1	No. 2	No. 3
The exchange energy, MJ	10,4	10,7	9,5
Feed units per 100 kg of feed additives	85	95	90
Crude protein, %	18	20	19
Crude fiber, %	10	10	12
Crude fat, %	–	3,4	3,3
Calcium, %	0,9	1,0	0,5
Phosphorus, %	0,7	0,8	0,8

Table 4

**Evidence based formulas to feed the lambs on the basis
of the feed additive**

Name of raw materials	Feed for lambs, %:		
	No. 1	No. 2	No. 3
Corn (Maize)	15,0	–	–
Barley	25,0	50,0	25,0
Feed wheat	10,0	10,0	20,0
Oat	10,0	8,0	–
Bran	20,0	7,0	25,0
Feed additives	20,0	25,0	30,0
Total:	100,0	100,0	100,0

developed 3 evidence-based formula of feed for 4 to 5-month-old lambs (table 4).

Formula No. 1 is developed with the introduction of a feed additive made of wastes of starch-production and therapeutic and prophylactic drug "Biokons" containing lactic acid bacteria for the prevention of diseases of the gastrointestinal tract of lambs.

Formula No. 2 is developed with the introduction of a feed additive made of wastes of oil and fat production.

Formula No. 3 is developed with the introduction of a feed additive made of waste of starch-and fat and oil industries.

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