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НАЦИОНАЛЬНОЙ АКАДЕМИИ НАУК
РЕСПУБЛИКИ КАЗАХСТАН

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THE IMPACT OF ADDRESS COMPOUND CONCENTRATED FEEDSTUFF ON THE DAIRY PRODUCTIVITY OF COWS AND THE QUALITY OF MILK

Abstract. As a result of the undertaken research, the chemical composition of feed in the basic farm of the Karimov SP was studied, the detailed rations were developed and the deficiency of biologically active substances was determined in them.

The most promising way to eliminate the deficit of minerals and vitamins in feeding animals is to enrich the rations with various feed additives. Of particular topicality is the use of biologically active substances in biogeochemical provinces, which are deficient in a number of macro- and microelements in soils and feeds.

Taking into account the needs and content of nutrients, macro- and microelements, as well as vitamins in the diet, their deficiency was determined, which amounted to 54.0% in sugar; 32.6% in phosphorus; 22.6% in copper; 81.1% in cobalt ; 53.1 in zinc; 73.6% in iodine; 38.5% in manganese and 81.4% in vitamin D (IU). Based on the deficit of macro-and micronutrients, as well as vitamins, a recipe for a compound concentrated feedstuff for cows with a productivity of 20-24 kg of milk per day was developed. Along with this, the chemical composition of the compound concentrated feedstuff was determined. The results of experimental studies showed that the eatability of the feed mixture in the control group was 89.46%, and in the experimental group - 93.66%, which is higher by 4.2%, and the dairy productivity of the cows in the experimental group increased by 6.98%, and in terms of 4% milk, this indicator increased by 9.98%, the cost of milk decreased by 4.9%.

Keywords: fodder base, chemical composition of feed, rations, nutrient deficiency, feed supplement, compound concentrated feed, dairy productivity.

Introduction. The feeding of highly productive animals is built on unconditional satisfaction of the physiological needs of the body for energy, nutrition, mineral, and biologically active substances. In working with highly productive animals, ration optimization is a priority. Any imbalance leads to serious metabolic disorders, reduced viability, animal productivity and quality of the obtained products [1,3]. In recent years, the negative correlation between high productivity, health and reproductive ability of animals has been increasingly noted. Scientists all over the world constantly study metabolic diseases of highly productive animals: with protein, carbohydrate, lipid, vitamin, and mineral, interrelated with each other directly or indirectly. According to the majority, among the causes of this pathology, as well as a decrease in animal productivity, the unbalanced feeding comes first. [2,4].

The development of new ways to improve the efficiency of use of feed nutrients in order to achieve full-fledged feeding of animals and to obtain high-quality animal products is particularly relevant today. To achieve this goal, complex biological products and additives that improve the taste and nutritional properties of feed are widely used, which ensures the achievement of the main feeding effect - increasing

the availability and digestibility of nutrients entering the body with a diet, increasing animal productivity [5, 8, 9, 10, 11]. Many of them are needed to regulate feed intake [15]. Today, individual components of diets, which recently seemed exotic or ballast, are increasingly being sold. [6, 12, 17].

In this regard, the study of the biological role of microbiogenic metals in all the most important metabolic reactions showed that the activity largely depends on the chelation properties. The formation of chelate compounds underlies the manifestation of reactive molecules, the conversion of biosubstrates into structurally organized specific systems, the formation of immunity, and other immunodynamic and biodynamic processes in the body. [7,13, 14].

D. Fremaut [14] indicates the distinctive properties of organic forms of microelements: a form that is protected from chemical reactions in the digestive tract; a form, ready for absorption, with a high rate of penetration through cell membranes; chelates are stable in an acidic environment; they can be absorbed in a manner similar to amino acids. High economic requirements for the profitability of production in market conditions force livestock producers to use more advanced technologies that ensure the maximum level of animal productivity, efficient use of fodder materials and lower feed costs for production. One of the tasks in the implementation of intensive resource-saving technologies in dairy farming is to create such feeding conditions in which energy and nutrient consumption are in accordance with certain standards. Under this condition, a level of productivity close to the genetic potential is achieved, health is preserved and high efficiency of production and breeding use of animals is ensured.

Modern development of animal husbandry is impossible without the use of scientific achievements [15,16]. One of the conditions for obtaining cheap high-quality products is the use in feeding animals of rations, balanced by a large number of nutrient, mineral and biologically active substances. A significant role in this is given to balancing additives, mineral and vitamin mixtures (AVMA, BMD, VMC). According to foreign and domestic practices, the use of biologically active substances in the feeding of farm animals and poultry has always proved to be profitable, that is, investing finance to purchase balancing additives, mineral and vitamin mixtures for feeding animals has always given a profit. In this regard, in the practice of feeding animals, the volume of various feed additives and especially compound feed, mineral and vitamin mixtures significantly expands every year. Thus, the intensification of livestock has led to the accelerated development of the industry of microbiological and chemical synthesis for the production of feed vitamins, amino acids, macro- and microelements, enzymes, antibiotics, carbamide and ammonium salts, tranquilizers, hormones, antioxidants and some other organic and inorganic biocatalysts [17,18].

The compositions of biologically active substances and compound feedstuffs are developed on the basis of modern scientific research on the animal's body needs for energy, protein, amino acids, vitamins, macro- and microelements, enzymes and other nutrients, taking into account the type, level of productivity, sex, and age of animals.

The extensive studies on the effectiveness of the use of various feed preparations, biologically active substances in animal husbandry were conducted [19]. At the same time, there are very few similar works in Kazakhstan, especially in dairy cattle breeding, which determines the relevance of this work.

Compensation of deficiency of minerals and vitamins in forage is an important direction in solving the problem of animals nutrition. In recent years, the lack of macro- and micronutrients and vitamins, as a rule, is replenished using inorganic salts. However, it does not take into account the antagonistic and synergistic relationships between individual mineral elements and the presence of adsorbing agents of feed origin. Salts of macro- and microelements in inorganic form are relatively difficult to digest in the gastrointestinal tract of animals, and increasing the dose to raise the level of assimilation can lead to toxicosis.

According to L.I. Shishov [20], of interest are chelated trace elements in the premixes of the Alltek company. They correspond to the natural complexes of mineral elements in forage crops and grain, have high bioavailability and bioactivity. The experiments of M.G. Volynkin [21] found that enrichment of the ration with the feed additive “Sanimix” in the amount of 1% of the daily diet of concentrated feeds allows to get 510 kg more milk than without using it. Analysis of economic efficiency showed that the introduction of feedings into the diet of lactating cows had a positive impact on the dairy productivity of animals. For the first 100 days of lactation, from cows of the experimental group, the 4% fat milk was received by 13.43% more than from animals in the control group.

M.G. Malikova, I.N. Akhmetova [22] in their studies found that balancing diets of young cattle for the missing nutrients by injecting feedings of protein-mineral-vitamin supplements (AVMA, BMD) and providing them with the necessary nutrients had a positive effect on the growth of forestomach microflora and ruminal digestion processes, while creating conditions for better digestibility and assimilation of nutrients of the diet, which contributed to a more intensive growth and development of animals ensured a high economic impact.

In their studies, L. Toporova, S. Serebrennikova, V. Galashov et al. [23] investigated the effectiveness of organomineral supplements on various types of animals and birds.

The highest live weight of one head - 1494.6 g - was established in the IV experimental group, the chickens of which received 0.15% vitabelmin as part of the compound feedstuff. In the control group, the average live weight of a broiler is 1377.9 g.

The live weight of animals at the end of fattening in the group receiving vitabelmin with the ration exceeded the control by 7.41 kg, or 2.69%.

A similar experiment was conducted on lactating cows. As a result of individual accounting of productivity indicators for each animal, it was found that after 30 days of feeding the supplement, the average daily milk yield of natural milk from cows in the experimental group was 8.3% higher than the control, and on the 90th day, the difference was 13.8%. On average, for the experimental period, 11.7% more milk was obtained from the cows of the experimental group than in the control group.

Thus, a review of the literature has shown that intensive research is being conducted in the development of doses of mineral additives and various supplements, and this is especially true for Russia. At the same time, most of the works are aimed at testing chelated microelements, conventional microelements, and microadditives, and also tests of already developed additives of a new generation are being conducted. Many studies are aimed at the development of protein-mineral-vitamin background, including not all the limiting factors of nutrition, but only some of them.

In Kazakhstan, practically no one deals with this problem in the regional aspect. Therefore, studies aimed at the investigation of affordable and cost-effective for commercialized feeding of various dressings, mineral supplements, and AVMA, which would possibly fill all the limiting factors is the current direction of research.

The aim of the research. Improving the biological full-value of diets and productivity of dairy cattle.

Methods of the research. The studies were conducted in the basic farm of Karimov SP of the Almaty region and the testing center to determine the chemical composition of feed and the quality of agricultural products of KazSRIAH&FP LLP.

Before the start of the experiment, the fodder base was studied, samples of feed were selected and their chemical composition was investigated.

For the experiment, two experimental groups of cows, 8 animals each with a yield of 5-6 thousand kg of milk per year for the previous lactation, were formed on the principle of pairs-analogues [24] (table 1).

Animals were kept in typical premises, without a leash. Caring for them was the same. Milking was conducted three times a day. The difference in feeding was that the animals of the experimental group received optimized rations with the inclusion of the feed additive, and the control group received an economic ration.

After studying the chemical composition of the feed and the formation of the experimental groups, taking into account the dairy productivity of the animals, detailed rations for the experimental group were developed and a nutrient deficiency was established, which served as the basis for the development of a recipe for compound concentrated feed. In the development of diets there were used the norms of feeding farm animals, developed by the All-Russian State Research Institute of Livestock [25].

In the course of the experiment, every ten days the quantity of given fodder was taken into account, once a month the animals' productivity, the palatability of feeds were recorded, and the milk fat content was determined.

At the beginning of the experiment, the chemical composition of the milk of experimental animals was studied on an InFraXact instrument manufactured by FOSS (Denmark).

Table 1 - Scheme of experience

Group	Number, heads	Feeding conditions
Control	8	BD – Basic diet
Experimental	8	BD + supplementary feed (compound feed - concentrate)

The obtained main digital material was processed by the method of variation statistics, using a computer program [26, 27].

Research results. In the course of the research work, the availability of feed in the farm was studied. The fodder base was represented by hay with alfalfa and mountain, corn silage, crushed barley, wheat, extruded soybeans and feed additives in the form of compound concentrated feedstuff, which compensated for the nutrient deficiency in the diet.

Samples were taken from the available feeds and their chemical composition was studied, which is presented in Table 2. The visual assessment of the feeds and the results of their chemical composition showed that the available feeds are of good quality, with the exception of corn silage. It had low quality in mind of harvesting corn during the period of full ripeness of grain.

Table 2 - Results of chemical analysis of feeds in Karimov SP in terms of natural moisture

Sample name	TM, %	DM, %	In natural appearance, %										feed unit per 1 kg	DP, g	ME, MJ	EFU
			protein	fat	fibre	NES	sugar	amylum	ash	Ca	P	carotin				
Alfalfa hay	18.54	81.46	15.3	6.5	34.0	20.4	-	31.5	5.26	0.98	0.24	27.2	0.49	99.7	7.9	0.79
Mounta in hay	11.36	88.64	15.0	4.1	29.4	32.7	-	8.2	7.38	0.61	0.27	22.2	0.55	76.7	7.4	0.74
Corn silage	64.02	35.98	3.3	1.4	12.9	17.2	2.79	5.0	1.17	0.83	0.19	10.1	0.23	18.4	3.3	0.33
Wheat grain	8.04	91.96	11.9	1.5	3.6	72.9	-	54.5	2.01	0.66	0.33	-	1.22	102.7	12.2	1.22
Barley grain	7.49	92.51	10.0	1.9	5.0	73.0	-	51.4	2.51	0.20	0.31	-	1.20	56.2	11.3	1.13
Compound feed granulated	10.72	89.28	17.0	3.4	9.3	54.7	-	50.5	4.97	0.76	1.63	-	1.12	140.9	11.0	1.10
Extrud ed soy	8.14	91.86	34.7	17.6	5.4	28.1	-	31.9	6.15	0.36	0.64	-	1.48	305.3	13.5	1.35

Before the start of scientific and business experience, two groups of animals were formed - the control and the experimental ones. During the equalization period, both groups of animals received the same rations, which, according to the experimental design, were later intended for the control group.

After the termination of the equalizing and transitional periods, taking into account the dairy productivity of the cows, the actual chemical composition of the feed and the optimized structure of the diet, detailed feeding rations for lactating cows were developed using a computer program. Average daily rations in the reference period of the experiment are shown in Table 3.

From the data of table 3 it follows that the bulky feed in the structure of the diet in the control group of the total demand for EFU was 65%, and concentrates - 38%. At the same time, the share of hay was

25%, silage - 40, barley - 15, feed wheat - 15 and soy - 8%. In the experimental group, it was respectively 65.1; 39.0; 25; 40.1; 5; 13.4; 7 and compound concentrated feed -13.0%.

Taking into account the needs and content of nutrients, macro-and micronutrients, as well as vitamins in the diet, their deficiency was determined, which amounted to 54.0% for sugar; 32.6% for phosphorus; 22.6% for copper; 81.1% for cobalt; 53.1% for zinc; 73.6% for iodine; 38.5% for manganese and 81.4% - vitamin D (IU).

Based on the deficit of macro and microelements, as well as vitamins, a recipe for compound concentrated feed for cows with a productivity of 20-24 kg of milk per day was developed (Table 4).

Along with this, the chemical composition of the feed was determined (Table 5).

In the course of scientific and business experience, control feeding was carried out monthly, as well as control milking, and the feeding rations of cows were corrected depending on the productivity of the animals of the experimental groups.

The diets of experimental animals had no differences in the range of feed materials.

Table 3 - Average daily rations of experimental cows during the reference period of the experiment (on average per 1 head).

Feed, kg	Group			
	Control		Experimental	
	norm	feed amount, kg	norm	feed amount, kg
1	2	3	4	5
Alfalfa hay	-	4.1	-	4.22
Mountain hay	-	2.81	-	2.74
Corn silage	-	32.83	-	32.88
barley	-	2.48	-	0.83
feed wheat	-	2.74	-	2.44
Soy extr.	-	1.0	-	0.86
Compound concentrated feedstuff	-	-	-	2.19
Total	-	45.94	-	46.16
The diet contains				
EFU	19.7	20.3	19.7	20.4
ME, MJ	197.0	202.6	197.0	203.7
DM, kg	21.4	21.6	21.4	21.8
CP, g	2750.0	2663.9	2750.0	2826.6
DP, g	1820.0	1824.8	1820.0	1980.7
SP, g	1763.0	1649.0	1763.0	1775.8
USP, g	987.0	893.0	987.0	929.1
CF, kg	5000.0	5056.8	5000.0	5151.0
Amylum, g	2390.0	3934.4	2390.0	3535.1
Sugar, g	1600.0	731.2	1600.0	739.9
Crude fat, g	565.0	808.3	565.0	820.6
Ca, g	123.0	168.1	123.0	181.8
Sodium chloride	115.0	109.2	123.0	123.0
Phosphorus, g	87.0	58.6	87.0	85.6
Magnesium, g	35.0	48.9	35.0	48.8
Potassium, g	133.0	263.6	133.0	269.6
Cu, mg	155.0	119.9	155.0	1149.8
Cobalt, mg	12.3	2.3	12.3	12.9
Zink, mg	1040.0	487.7	1040.0	1586.7
Manganese, g	1040.0	639.6	1040.0	1040.6
Iodine, mg	14.2	3.7	14.2	12.9
Vitamin D, IU	16700.0	3104.1	16700.0	16604.6
Vitamin E, mg	665.0	2206.3	665.0	2320.7
Carotin, mg	745.0	879.0	745.0	921.6

The difference was only in the fact that the animals of the experimental group received a supplementary feed in the form of compound feed, which compensated for the deficiency of biologically active elements. This, in turn, influenced the palatability of the feed, and therefore the consumption of nutrients and biologically active substances.

It should be noted that the feed was given in the form of a feed mixture, so the palatability of the feed was quite high. In our experience, the palatability of the feed mixture in the control group was 89.46%, and in the experimental group - 93.66%, which is 4.2% higher. The lower palatability of the feed mixture in the control group is associated with a deficiency of certain nutrients. It is known that with a lack of biologically active substances in the diet, loss of appetite is observed, oxidative processes are slowed down, metabolism in animals is disturbed, etc.

Table 4 - Feedstuff recipe for lactating cows with a productivity of 6.0-6.5 thousand kg of milk per lactation

Name of feed	Unit of measure	content
corn	%	25
barley	%	22
feed wheat	%	13
wheat middling	%	17
cattle cake or soybean meal	%	14
oats	%	6
sodium chloride	%	1
Bulk moulding compound	%	2

Table 5 - Chemical composition of the compound concentrated feedstuff for cows with the productivity of 6.0-6.5 thousand kg of milk per lactation

Indicators	Unit of measure	content
EFU		1.17
ME	MJ	11.64
DM	g	892.8
CP	g	170.0
SP	g	110
USP	g	60
DP	g	140.0
Crude fat	g	34.0
Crude fiber	g	63.0
Amylum	g	316.0
Sugar	g	10.0
Calcium	g	2.0
Phosphorus	g	16.0
Magnesium	g	2.0
Potassium	g	11
Sulfur	g	6.0
Ferrum	mg	50.0
Cooper	mg	16.0
Zink	mg	280.0
Manganese	mg	235.0
Cobalt	mg	5.0
Iodine	mg	4.0
Carotine	mg	0.9
Vitamin D	IU	6000.0
Vitamin E	mg	10.3

On average, cows of the control group received 45.94 kg of feed mixture per day, and the cows of the experimental group - 46.16 kg. At the same time, the feed mixture included alfalfa hay, grass hay, corn silage, barley, wheat, soybean, and compound concentrated feed.

By the composition of feed, the rations of the experimental groups did not differ from each other. The structure of the rations was also almost identical. So the share of alfalfa hay in the control group was 15%,

grass hay - 13.0, corn silage 28.5, concentrates 43.5%, and in the experimental one - 16.6; 14.7; 26.7 and 42.0%.

In the experimental group, the consumption of all nutrients was higher than in the control group, which is associated with higher palatability of feed and animal productivity. In the control group, 1 kg of dry matter accounted for 123 g of protein, and in the experimental group, - 130 g, or higher, respectively, by 5.7%, which almost corresponded to the norm.

In both diets, there is a significant shortage of sugar, since at present there is almost nothing to fill it with. In this regard, it was given a little more amylum, because in the organism, part of it turns into sugar.

Introduction to the diet of the experimental group of the compound concentrated feedstuff allowed to balance the diet in accordance with the norms on trace elements and vitamins. Thus, the diet of the experimental group fully satisfied the animals' need for basic nutrients and biologically active substances, which positively affected the dairy productivity of cows and the quality of milk (Table 6).

Table 6 - Dairy productivity of cows for the experimental period

Indicator	Group	
	Control	Experimental
Milk yield for the experiment period, kg:		
natural fatness	923.22±8.13	987.62±8.47
4% fatness	826.29±7.81	908.61±8.21
Average daily milk yield, kg:		
natural fatness	20.07±0.39	21.47±0.57
4% fatness	17.97±0.38	19.76±0.47
Fat mass fraction,%	3.58±0.04	3.68±0.05
Protein mass fraction, %	3.21±0.13	3.28±0.17
Total, kg: milk fat	33.08±1.74	36.35±1.14
milk protein	29.64±3.56	32.41±2.07

From the data of table 6 it can be seen that from the cows of the experimental group, for the period of the experiment, it was obtained more natural fat milk compared to the control group by 1.40 kg or 6.98%, and in terms of 4% milk this indicator increased and amounted to 1.79 kg or 9.98%. The fat content in the milk of cows from the experimental group was 0.10% higher than in the control group. This, in turn, affected the yield of milk fat. So, 36.35 kg of milk fat was received from cows of the experimental group, and from the analogues - 33.08 kg or more by 9.8% (3.27 kg), and milk protein - by 9.35% or 2, 77 kg respectively.

Along with dairy productivity, the chemical composition of the milk of experimental animals underwent certain changes under the influence of detailed rations and compound feed (Table 7).

The data of Table 7 allow to state the positive dynamics of protein and fat content in the experimental group of cows. In terms of fat content, the milk of animals from the experimental group exceeded the control by 0.10 absolute percent, protein by 0.01%, casein by 0.06 abs.%, lactose by 0.01 abs.%. On the content of somatic cells, there are practically no differences between the experimental groups. Milk of both groups can be attributed to the highest grade.

As for urea, it should be noted that with a normal protein content in milk (3.2%), the desired urea content should be 15-30 mg/%. The content of urea in milk below 15 mg/% indicates a deficiency of protein in the rumen. This limits the activity of rumen microorganisms, which reduces feed intake and, consequently, dairy productivity. In our experience, although these indicators in both groups were within the normal range, however, in the control group it is close to the lower limit, indicating a lower protein content in the rumen.

The ratio of fat and protein in milk also characterizes the functional state of the digestive system. Normally, this ratio should be 1.15-1.40 conventional units. In the milk of the control and experimental groups, this indicator is normal.

Table 7 - The chemical composition of milk of dairy cows

Indicator	Unit of measure	Group	
		Control	Control
Fat	%	3.58±0.04	3.68±0.05
Protein	%	3.21±0.13	3.28±0.17
Somatic cells	thous./cm^3	84.5±18.1	88.02±17.4
Casein	%	2.56±0.11	2.62±0.16
Lactose	%	4.68±0.4	4.69±0.11
Urea	mg %	15.36±1.42	18.24±1.28

Summary and evaluation of the research results. The basis of feeding highly productive animals consists of unconditional satisfaction of the physiological needs of the body for energy, nutrition, mineral, and biologically active substances. In working with highly productive animals, ration optimization is a priority. Any imbalance leads to serious metabolic disorders, reduced viability, animal productivity, and product quality.

Among the factors that determine the usefulness of feeding dairy cows, the conditions of mineral and vitamin nutrition are essential.

The most promising way to eliminate the deficiency of minerals and vitamins in feeding animals is to enrich the rations with feed additives.

Of particular relevance is the use of biologically active substances in biogeochemical provinces that are deficient in a number of trace elements in soils and feeds.

The development of address recipes for compound feed concentrates for each soil-climatic zone makes it possible to fully obtain high animal productivity and increase the profitability of animal husbandry. In this regard, during the scientific and business experience, the chemical composition of the feed of the farm was studied, detailed rations were developed, the deficiency of biologically active substances was established, and a recipe for compound feed concentrate was developed on its basis.

Feeding lactating cows with compound feed in the composition of the diet made it possible to increase the palatability of the feed mixture in the experimental group by 4.2% compared with its analogues.

The best palatability of feed, optimization of nutrients in the diet of the experimental group had a positive impact on the dairy productivity of animals. So, from the cows of the experimental group for the experience period, the milk of natural fat content was obtained in comparison with the control group by 1.40 kg or 6.98%, and in terms of 4% fat milk this indicator increased and amounted to 1.79 kg or 9.98%. The fat mass fraction in the milk of cows from the experimental group was 0.10% higher than in the control group. This, in turn, affected the yield of milk fat. So, 33.08 kg of milk fat was obtained from cows in the control group, and from the analogues - 36.35 kg or more by 9.8% (3.27 kg). Analysis of the milk chemical composition allows us to state the positive dynamics of protein and fat content in the experimental group of cows. In terms of fat content, the milk of animals from the experimental group exceeded the control by 0.10 absolute percent, protein by 0.01%, casein by 0.06 absolute %, lactose by 0.01 absolute %. By the content of somatic cells, there are practically no differences between the experimental groups. Milk of both groups can be attributed to the highest grade.

As for urea, it should be noted that with a normal protein content in milk (3.2%), the desired urea content should be 15-30 mg/%. In our experiment, although these indicators in both groups were within the normal range, however, in the control group it is close to the lower limit, indicating a lower content of available protein in the rumen.

The ratio of fat and protein in milk also characterizes the functional state of the digestive system. Normally, this ratio should be 1.15-1.40 conventional units. In the milk of the control and experimental groups, this indicator was within the normal range. However, in the control group, this indicator was almost at the bottom.

Thus, the use of detailed rations and address feeds allowed to improve metabolic processes in the body, increase the dairy productivity of cows in the experimental group by 6.98%, and in terms of 4% fat milk by 9.98% and reduce the cost of milk by 4.9%.

The experience shows a high production efficiency and the use of addressed feed concentrates in the preparation of optimized detailed rations. Giving the feed available in the farm in the form of balanced rations is the basis for further improving the productivity of animals, reducing feed consumption per unit of production and its cost. In the course of scientific and business experience, detailed rations and the recipe for compound concentrated feed were developed taking into account the deficiency of biologically active substances in the diet. Based on this recipe was produced feed for dairy cows. The results of experimental studies have shown that the palatability of the feed mixture in the control group was 89.46%, and in the experimental group - 93.66%, which is higher by 4.2%.

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СҮТ ӨНІМДІЛІГІНЕ ЖӘНЕ САПАСЫНА АРНАЙЫ РЕЦЕПТІМЕН ДАЙЫНДАЛҒАН ҚҰРАМАЖЕМ-КОНЦЕНТРАТТЫҢ ӘСЕРІ

Аннотация. Тәжірибе жүргізу барысында «Каримов» ЖК базалық шаруашылығында азықтардың химиялық құрамы зерттелді, азықтағы биологиялық белсенді заттардың тапшылығы анықталып, соның негізінде тетіктелген азықтандыру рационы құрастырылды. Малдарды азықтандыруда рациондағы минералдық заттар мен дәрумендердің жетіспеушілігін болдырмаудың ең тиімді әдісі құрама жеммен қанықтыру болып саналады.

Топырақ және азық құрамында бірқатар микроэлементтер жетіспейтін биогеохимиялық аймақтарда биологиялық белсенді заттарды пайдаланудың өзектілігі артуда.

Малдың рациондағы қоректік заттардың мөлшері мен мұқтаждығын есепке ала отырып, макро- и микроэлемент-тердің, витаминдердің, басқа да қоректік заттардың тапшылығы анықталды, яғни қант 54,0%; фосфор – 32,6; мыс – 22,6; кобальт – 81,1; мырыш – 53,1; йод – 73,6; марганец- 38,5 и витамин Д (МЕ) – 81,4% құрады. Макро- и микроэлементтердің, витаминдердің, басқа да қоректік заттардың жетіспеушілігі негізінде тәулігіне өнімділігі 20-24 кг сүт беретін сауын сиырларға арналған комбикорм-концентрат рецепті дайындалды. Сонымен бірге комбикорм-концентраттың химиялық құрамы анықталды. Зерттеу жұмыстарының нәтижесі көрсеткендей, бақылау тобындағы азық қоспаларының желінуі 89,46%, ал тәжірибелік топта 93,66%, яғни 4,2% жоғары болды. Мұның барлығы өз кезегінде тәжірибе тобындағы сиырлардың сүт өнімділігін 6,98%, 4% -дық сүтке шаққанда 9,98% арттырып, сүттің өзіндік құнын 4,9% төмендетті.

Түйін сөздер: Азықтық қор, азықтардың химиялық құрамы, рациондар, қоректік заттардың тапшылығы, азықтық қоспа, құрама жем-концентрат, сүт өнімділігі.

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ВЛИЯНИЕ АДРЕСНЫХ КОМБИКОРМОВ-КОНЦЕНТРАТОВ НА МОЛОЧНУЮ ПРОДУКТИВНОСТЬ КОРОВ И КАЧЕСТВО МОЛОКА

Аннотация. В результате проведенных исследований изучен химический состав кормов в базовом хозяйстве ИП «Каримов», разработаны детализированные рационы и определен в них дефицит биологически активных веществ.

Наиболее перспективным способом ликвидации дефицита минеральных веществ и витаминов в кормлении животных является обогащение рационов различными кормовыми добавками. Особую

актуальность приобретает использование биологически активных веществ в биогеохимических провинциях, дефицитных по ряду макро – и микроэлементов в почвах и кормах.

С учетом потребности и содержания питательных веществ, макро- и микроэлементов, а также витаминов в рационе был определен их дефицит, который составил по сахару 54,0%; фосфору – 32,6; меди – 22,6; кобальту – 81,1; цинку – 53,1; йоду – 73,6; марганцу- 38,5 и витамину Д (МЕ) – 81,4%. На основании дефицита макро- и микроэлементов, а также витаминов был разработан рецепт комбикорма-концентрата для коров с продуктивностью 20-24 кг молока в сутки. Наряду с этим был определен химический состав комбикорма-концентрата. Результаты экспериментальных исследований показали, что поедаемость кормосмеси в контрольной группе составила 89,46%, а в опытной – 93,66%, что выше на 4,2%, а молочная продуктивность коров в опытной группе увеличилась на 6,98%, а при пересчете на 4%-ное молоко этот показатель увеличился на 9,98%, себестоимость молока уменьшилась на 4,9%.

Ключевые слова: кормовая база, химический состав кормов, рационы, дефицит питательных веществ, кормовая подкормка, комбикорм-концентрат, молочная продуктивность.

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