Innovative developments: complex feed concentrates – lizunts; carbohydrate-vitamin-mineral complexes; buffer premixes – deoxidizers

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Abstract. Animal husbandry of the Republic of Bashkortostan occupies about 94% of the structure of gross agricultural output. The leading industry in the livestock industry of the republic is cattle breeding, which accounts for about 66% of the meat produced. Near the cities, cattle breeding is developing in the meat and dairy direction, in the mountainous and northeastern regions - meat and meat-dairy. The share of pork in the meat balance is about 17%, lamb is about 2%. Forage production is the foundation on which the production of livestock products is based. The main feed products are bulky (coarse and juicy) feed of own production, where the main consumers are ruminants. For a complete and balanced feeding, not only concentrated feeds are needed, but also feed additives that make up for the lack of protein, carbohydrates, vitamins and minerals, prepared with local cheap, affordable raw materials. Such additives developed by the staff experimental station "Ufa" Ufa Federal Research Center of the Russian Academy of Scienc, include complex feed concentrates – lizunts, carbohydrate-vitamin-mineral complexes – salt blocks and buffer deoxidizers to reduce the acidity of the rumen of highly productive cows.

1 Introduction

In Bashkortostan, in the production of agricultural products, the share of private subsidiary farms accounts for about 62%, agricultural organizations – 31 and farms – 7%. In the structure of gross agricultural output, animal husbandry occupies about 94%, crop production – 5.5% (mainly vegetable growing in closed ground).

The leading branch of animal husbandry in the Republic of Bashkortostan is cattle breeding. Near large cities, dairy and meat cattle breeding specializes in the production of fresh milk, and away from cities, milk is processed into butter and cheese.

The main direction in the development of pig farming is the production of meat and bacon pork. Sheep farming is represented by semi-fine-wool and fine-wool directions. Goats give milk and down, which is used to make down shawls. The development of

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poultry farming was largely facilitated by the creation of a number of large poultry farms in suburban areas.

Horse breeding and beekeeping give specifics to the agriculture of Bashkortostan. Horses are used as working cattle, meat and dairy animals. Bashkir horses can produce 1600-1800 liters of milk per season, from which a fermented milk, medicinal product – koumiss is prepared. The fifteenth part of the bee colonies of Russia is concentrated in the Republic of Bashkortostan. Many agricultural enterprises and the private sector of the republic are engaged in beekeeping. The natural conditions for beekeeping are favorable – up to 380 species of honey plants grow in forests and meadows.

Animal husbandry provides more than half of the agricultural products of the republic. Hayfields and pastures occupy 2.6 million hectares of land, but their productivity is low, providing only less than half of the required feed. The rest of the feed is provided by cereals, legumes and seeded grasses, which occupy every fourth hectare of crops. The industry of the republic supplies chemical, micro- and biological, protein-vitamin preparations, vitamins, polysols of trace elements, etc. Waste from sugar beet, brewing, oil extraction plants, as well as distilleries and fermentation plants are also used in animal husbandry.

The purpose of the study is to develop innovative feed additives for cows of all physiological groups and different genders of young cattle bred in the Republic of Bashkortostan.

Some enterprises and private entrepreneurs have begun to produce feed additives with various directional effects to obtain short-term benefits "due to the accelerated growth of animal productivity" without considering the natural and climatic conditions (landscape, soil and vegetation cover), the physiology of digestion and the structure of the gastrointestinal tract, without thinking about the health and duration of productive longevity of the animal. All these additives must be scientifically substantiated, reasoned and certified – production testing within 3-5 years in the best farms of the republic.

2 Materials and methods

In our developments, we consider these nuances: not only the geography and growing areas of certain types of feed products, but it is especially important – the type and breed of the animal, physiological condition, productivity level, microclimate conditions, maintenance and care. Our pets should be fed with those feeds and additives that grow or are prepared in our conditions and enterprises. Based on the norms of the needs [1,4] of this type of animal, as well as considering the availability and stocks of feed products in connection with environmental safety, feed additives were developed in the form of complex lizunts-briquettes, salt blocks and buffer premixes for adult and young cattle.

3 Results and discussion

Table 1 shows the composition and structure of suckers for cows of dry and transit periods per 1 kg of additive. The concentration of metabolic energy in 1 kg of natural lizun was 10.99 MJ, and the crude protein content was 134.55 g [2,3,5].

Table 1. Recipes for a complex feed concentrate (CFC) for pregnant dry cows of the southern forest-steppe zone of the republic with stable maintenance

Ingredients, g	Identifier, structure		
	CFC 60–2 (S1)	CFC 60–2 (S2)	CFC 60–2 (S3)
Levure fourragère	175	176	171

Glycérine (E422)	210	213	215
Mélasse fourragère	162	165	167
Coupe de légumineuses à base de plantes	115	115	115
Phosphate de Monoammonium	156	155	154
Pâte de pommes de pin vertes	45.87	40.90	44.92
Sel iodé / (KI), mg	35/55.6	34/56.1	32/57.0
Élément de liaison	100	100	100
Sulfate de zinc, mg	7100	7115	7125
Chlorure de cobalt, mg	86	85	87
Oil solution vit. A (1ml 100000 IU), ml	3.5	3.5	3.5
Solution d'huile vit. D_3 (1ml 50000 UI), ml	0.5	0.5	0.5
Total	1000	1000	1000

Table 2 shows a comprehensive assessment of the nutritional value of one of the lizunets recipes for this physiological group of cows in the southern forest-steppe zone of the republic with summer pasture content. The concentration of the metabolic energy of the lizunz (in a completely dry substance) was 14.58 MJ, and the crude protein content was 16.47% [6].

Table 3 shows a lizun with a weight of 20 kg (in a container) for new-bodied cows of the southern forest-steppe zone with winter stall maintenance. 1 kg of natural lemon contains 10.5 MJ Energy exchange and 123.56 g of crude protein.

4 Conclusions

Table 4 shows the variants of the carbohydrate-vitamin-mineral complex (hereinafter abbreviated CVMC) "Uralmix", which are finely dispersed dense pasty or solid pressed products obtained by mechanical mixing and compaction of finely ground macro- and microelements, synthetic nitrogen-containing substances (SNCS), vitamins, amino acids, antioxidants, easily digestible carbohydrates, probiotics and other stimulants and metabolic correctors of farm animals [8, 9, 10, 11, 12].

Currently, a lizunets with the recipe identifier CFC-N1 is undergoing production testing on new-bodied cows on the farm of the Agricultural Production Cooperative «Druzhba» in the Aurgazinsky district of the republic. All the following lizunts are an addition to the basic diet of feeding animals of a particular physiological group [7].

Table 2. The concentration of dry matter and nutrients in 1 kg of CFC 60-3 (S1) for a pregnant dry-resistant cow with a live weight of 600 and a planned milk yield of 6000 kg. Pasture maintenance. Licking per day up to 200 g

Ingredients, g	Quantity	Exchange energy, MJ	Energy feed unit	Dry matter, g	Crude protein, g	Calcium, g	Phosphorus, g	Sugar, g	Cu, mg	Zn, mg	Co, mg	I, mg	Carotene, mg	Vitamin D, IU
Sunflower meal (cake)	165	1.71	0.17	148.5	66.82	0.97	2.13	10.33	2.84	6.6	0.03	0.06	0.33	0.82
Soapstock	178	6.41	0.64	75	-	-	-	-	-	-	-	-	-	-
Beet molasses	250	2.35	0.23	200	24.75	0.8	0.05	136	1.15	5.20	0.15	0.18	-	-
Grass cutting	115	0.99	0.09	103.5	21.73	1.99	0.34	4.6	0.97	3.33	0.023	0.05	23	11.5
Monoammonium Phosphate	110	-	-	86.5	24.2	-	29.7	-		-	-	-	-	-

Iodized salt, g / (KI), mg	82/55.6	-	-	75	-	-	-	-		-	-	41.9	-	-
Binding element, g	100	-	-	95	-	33	-	-		-	-	-	-	-
Copper sulphate, mg	182	-	-	0.15	-	-	-	-	43	-	-	-	-	-
Zinc sulfate, mg	2610	-	-	2.3	-	-	-	-		587	-	-	-	-
Cobalt chloride, mg	38	-	-	0.025	-	-	-	-		-	9.5	-	-	-
Vitamin A oil solution (1 ml 100000 IU), ml	4.4	The daily norm is 675 mg of carotene, the deficiency is 220 mg										-	1100	-
Total	1000	11.46	1.14	786	137.5	33	45.5	151	47	602	9.7	42.2	1123	12.32

Table 3. A lizun for a new-bodied cow with an average daily milk yield of 20 kg of milk per lactation. Licking at 200 g / head / day, duration 100 days. Weight 20 kg

Ingredients, g	Quantity	Exchange energy, MJ	Energy feed unit	Dry matter, g	Crude protein, g	Calcium, g	Phosphorus, g	Sugar, g	Zn, mg	Co, mg	Carotene, mg	Vitamin D, IU
Soy meal	3700	25.56	2.55	3330	1623.4	10	24.4	351.4	153.92	2.76	4.32	2100
Glycérine	4000	76.2	7.62	3524	-	-	-	-	-	-	-	-
Feed molasses	4120	18.24	1.82	3296	407.8	13.2	0.8	2235	85.7	1164	-	-
Monoammonium Phosphate	3980	-	-	3798	440	-	1080	-	-	-	-	-
Green Pinecone fruit paste	1000	-	-	779	-	-	-	-	-	-	-	-
Feed salt	1000	-	-	956	-	-	-	-	-	-	-	-
The binding element	2000	-	-	1140	-	660	-	-	-	-	-	-
Zinc sulfate, mg	200880	-	-	0.2	-	-	-	-	45200	-	-	-
Cobalt chloride, mg	2140	-	-	0.002	-	-	-	-	-	530.6	-	-
Vitamin A oil solution (1 ml 100,000 IU)	160	-	-	-	-	-	-	-	-	-	8880000	-
Vitamin D_3 Oil Solution (1ml 50000 IU)	12	-	-	-	-	-	-	-	-	-	-	540000
Total	20000	120	12.0	16988	2471.2	683.2	1105	2586.4	45439.62	1697	8880004	542100

Table 4. Recipes of carbohydrate-vitamin-mineral complexes "Uralmix", %

№ п/п	Name of the components	Lactating cows			Stale dry-resistant cows			Young cattle		
		1-1	1-2	1-3	1-1	1-2	1-3	1-1	1-2	1-3
1	Granulated sugar	20	15	15	25	25	23	12	12	12
2	Feed salt	18	18	18	10	10	10	20	20	20
3	Monocalcium Phosphate	14	10	12	10	10	10	15	15	15
4	Activated zeolite	10	10	10	15	17	19	15	17	19
5	Premix	10	10	10	10	10	10	10	10	10

6	Beet molasses	10	13	15	16	14	14	16	14	12
7	Magnesium oxide	3	3	3	2	2	2	-	-	-
8	Carbamide	3	2	2	-	-	-	-	-	-
9	The binding component	2	2	2	2	2	2	2	2	2
10	Dolomite flour	10	10	10	10	10	10	10	10	10
11	Ammonium Sulfate	-	3	3	-	-	-	-	-	-
12	Diammonium Phosphate	-	4	-	-	-	-	-	-	-
13	Total	100	100	100	100	100	100	100	100	100

Table 5. Recipes for deoxidizer buffers for new-bodied cows, %

Name of the component	Option	
	1	2
Activated zeolite	45	43
Dolomite flour	25	24
Baking soda	17	16
Magnesium oxide	13	13
Yeast And - Sak	-	4
Total	100	100

Note on table 5.

The feeding rate is 300 g/ head / day.

The use of drugs at high rates of concentrate feeding makes it possible to reduce the acidity of the rumen of cows by 0.3... 0.4 units and increase the dairy productivity of cows in the new year period by 2-3 kg / head / day.

Instead of I–Sak, you can use "Clover-Pro" or other analogues.

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