http://www.moderntechno.de/index.php/meit/article/view/meit21-01-024
DOI: 10.30890/2567-5273.2022-21-01-024

УДК 636.2. 082.0.84.085.7. 2.11

DEVELOP RECIPES FOR RATIONS FOR SUCKLING YOUNG OF MEAT COMOLA SIMMENTAL IN THE STALL PERIOD OF CULTIVATION IN THE WESTERN CARPATHIANS

РОЗРОБКА РЕЦЕПТІВ РАЦІОНІВ ДЛЯ ПІДСИСНОГО МОЛОДНЯКУ МЯСНОГО КОМОЛОГО СИМЕНТАЛУ У СТІЙЛОВИЙ ПЕРІОД ВИРОЩУВАННЯ В УМОВАХ КАРПАТСЬКОГО РЕГІОНУ УКРАЇНИ

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Abstract. *The results of studies on the development and optimization of the composition of feeding rations for suckling calves meat simental in the stall period and the establishment of their efficiency taking into account zonal peculiarities of the chemical composition of the feed. We have found that differences in the consumption and cost of nutrients of feed between the experimental groups was not significant. It is established that during the main period of experiment in heifers of the experimental group, which were injected drug, average daily gain was 750,1 g that on 100,0 g or 15.4 %, P<0,01 more peers in the control group who were using the fodder of the economy without the introduction of drugs. While the growth rate of calves, which were injected drug research during the main period of experience was 830,2 g that 150,1 g or 22,1 %, P<0,001 analogs more control. Studies have shown that in the final period of experiment, daily gains of heifers of the experimental group was – 870,2 g that 230,1 g, or 35,9 percent, P<0,001 more from peers in the control group. In bulls of the experimental group, the same indicator was more than control peers on 190,1 g or 25,0 %, P<0,01. The results of studies for the whole period of experiment in heifers of the experimental group the average daily gain was equal to – 800,3 g that 150,1 g or 23,1% more peers control, gobies of the experimental group during this period was dominated by the control – on 310,0 g or 53,4% of the. Determined that the best feed products also have Chicks of the experimental group and amounted to 3,32 K. U., K. 0,51 units or 13,3% less than peers in the control group, and the cost of feed per unit of gain in bulls – of 3,04 K. U., K. 0,67 units or 18,1 per cent is also less than the control group with the concentration of metabolizable energy in one kilogram of dry matter of Chicks of the experimental group 20,5%, and calves – 19,5% inferior to their peers in the control group .The studies proved that in the blood of heifers and steers treated with experimental drug, increased red blood cell count of 6,5 and 4,7 per cent, the hemoglobin concentration 3,9 and 8,7 %, the content of total protein 10,4 and 12,3 %, albumin – 11,4 and 16,4 %, total calcium by 2,0 and 2,4 %; inorganic phosphorus – by 4,2% and 12,5 %; the activity of the enzymes alanine - and aspartataminotransferase – 6,7 and 10,5 and 4,9 and 9,7 %, of alkaline phosphatase activity – 2,2 and 3,7 %, compared with the control group.*

Keywords: *breed, technology, heifers, diet, feed, daily gains, productivity, cost.*

Постановка проблеми.

In the conditions of the Ukrainian market where the food problem is the most acute for the Ukrainian population [2]. Analysis of the dynamics of cattle, milk and beef production in Ukraine shows that the food problem is quite relevant today [3,5, 7]. In this regard, domestic zootechnical science has been enriched with important data that suggest that further improve the quality of feeding ruminants in general, and meat, in particular, should be not only to increase the rate of metabolic energy and nutrients in the daily diet, but and increasing its biological value for the conditions of the Carpathian region.

A special place in the structure of meat resources is occupied by ruminant meat, which is in great demand both in the domestic and foreign markets. In Ukraine, beef is mainly obtained by using over-repair livestock and slaughtered adult livestock of dairy and dairy-meat breeds for slaughter. [5, 12, 14,].

In the context of the global economic and financial crisis, domestic zootechnical science has been enriched with data that suggest that further improvement in the quality of feeding cattle in general, and meat in particular should be associated not so much with increasing metabolic energy and nutrients. in the daily diet, how much with the increase of its biological value, which is relevant in the Carpathian region of Bukovina [4, 14]. Thus, modern recipes for rations for beef cattle can not be imagined without the appropriate additives of trace elements, the introduction of which is periodically revised in the light of new advances in science and practice [5,7].

Research has now intensified to determine the need of cattle for mineral elements, which were not previously taken into account in the diet, but have been shown to have a significant effect on the body of ruminants. Selenium, which is recognized as an indispensable biotic ultramicroelement, is one of such elements and their compounds that attract the attention of scientists and specialists in the field of meat cattle breeding. According to the results of numerous studies conducted on different species of animals, it was found that selenium has antioxidant, immunostimulatory, anticancer, antimutagenic, adaptogenic, antiviral and radioprotective properties [6,11,15,]. The inclusion of selenium in the diet improves their health, increases productivity and efficiency of feed use [1, 2, 7, 8]. It has a significant impact on the absorption of vitamins A, C, E in the body, which are closely interrelated in metabolic processes [8,13].

At the same time, the use of such elements as selenium and vitamin E in feeding on the new population of meat Simmental ruminants with a pronounced natural tenderness is the most pressing issue in the Carpathian region of Bukovina [12, 14].

Because the domestic drug "Devit - Selenium" is used to correct and normalize metabolic processes in animals, but data on the use of meat comola Simmental in feeding are almost non-existent. An important role in the composition of the new complex drug is played by the trace element selenium, which participates in redox processes in the enzymes glutathione peroxidase, phospholipid glutathione peroxidase, oxidoreductases and some transferases. Vitamin E, which is a natural antioxidant and participates in the prevention of peroxidation of unsaturated fatty acids, vitamins A and D, carotenoids, etc., plays an important role in its composition.

"Devivit Selenium" contains Lycopene - a natural carotenoid that has no vitamin A activity and exhibits antioxidant, cytoprotective properties and is a stimulator of tissue regeneration [2, 3, 9, 13].

Thus, all of the above necessitates the development and optimization of the composition of recipes for feeding rations of suckling young meat comolo Simmental cattle in the stall period and establish the effectiveness of their use taking into account the zonal characteristics of the chemical composition of feed.

The aim is to develop new recipes for rations for the use in feeding of complex drugs for the correction and normalization of metabolic processes for suckling young meat comologous Simmental ruminants in the stall period of cultivation in the Carpathian region of Ukraine.

Material and research methods.

In the course of the research, the conditions of care, feeding and keeping of experimental young were the same. For the experiment, two groups of analogues (heifers and bulls) were formed, with 10 heads in each. The initial live weight of young control groups was 57.6–61.8 kg, respectively, experimental - 58.9–59.6 kg.

In the organization of feeding to the recipe of the diet (Table 1) in the main period of the experiment included: whole milk - 7.21-7.22 kg, hay - 0.25-0.31 kg, feed - 0.32-0.33 kg . The recipe of the diet contained: metabolic energy - 17.3-17.5 MJ, k. - 2.49–2.52 kg, digestible protein - 218.5–228.3 g, dry matter - 1.48–1.97 kg, sugar - 241–249 g, calcium - 15.2–15.7 g g, phosphorus - 8.67-10.5 g.

The composition of the complex drug "Devivit Selenium" was as follows: vitamin E (alpha-tocopherol acetate) - 50 mg, selenium (in the form of sodium selenite) - 0.5 mg, lycopene - 1 mg, filler - up to 1 ml. The drug was included in the recipe in the amount of 10 ml per 50 kg of body weight. [thirteen]. The duration of the main period of the experiment is 60 days, the final - 30 days.

Research results.

Differences in feed intake and nutrient consumption between the experimental groups were insignificant. In particular, the consumption of metabolic energy and dry matter per 100 kg of live weight in experimental heifers was 18.0 MJ and 2.0 kg against 19.0 MJ and 2.0 kg in the control group, while the bulls of the experimental groups, they were slightly larger and were equal to 23.7 MJ and 2.77 kg, respectively, against 21.8 MJ and 2.90 kg in the control. The consumption of metabolic energy per unit of growth in experimental heifers was at the level of 23.07 MJ against 37.58 MJ in the control group, in bulls they were, respectively - 21.1 MJ against 38.6 MJ. Similarly, the concentration of metabolic energy in one kilogram of dry matter of heifers in the experimental group by 20.5% and bulls - by 19.5% were inferior to peers in the control group.

It was found that during the main period of the experiment in meat heifers of the experimental group, which was administered the drug, the average daily gain was 750.1 g, which is 100.0 g or 15.4%, $P < 0.001$ more than peers in the control group, who were on the feed of the farm without the introduction of drugs. While the growth rate of bulls, which were administered the experimental drug during the main period of the experiment, was - 830.2 g, which is 150.1 g or 22.1%, $P < 0.001$ more than control analogues.

Table 1 - Live weight and growth of experimental animals during the experiment, (M ± m, n = 10 in each group)

Indicator	Groups			
	control		research	
Number of animals, heads	cattle bulls	heifers of cattle	cattle bulls	heifers of cattle
Live weight, kg:				
at the beginning of the experiment	61,8±1,20	57,6±1,40	59,6±1,50	58,9±1,20
at the end of the main experiment	96,5±1,50	90,5±1,30	101,8±1,40	97,0±1,20
Increase:				
total, kg	34,7±0,87	32,9±0,67	42,2±0,75	38,2±0,85
average daily, g	680,1±0,75	650,1±0,65	830,2±0,74***	750,1±0,57
Feed costs per 1 kg of gain, k.	3,71	3,83	3,04	3,32
Live weight, kg:				
at the end of the final period	120,8±1,70	111,1±2,10	132,3±2,30	124,8±1,60
Increase:				
total, kg	24,3±0,56	20,6±0,54	30,5±0,55	27,8±0,54
average daily, g	760,1±0,56	640,1±0,45	950,2±0,65***	870,2±0,75
Gain for the whole period of the experiment:				
total, kg	47,5±0,57	53,5±0,45	72,7±0,64	65,9±0,55
average daily, g	580,1±0,45	650,2±0,56	890,1±0,65***	800,3±0,75

Note. **** p <0.001 - the probability of the difference between the experimental groups over the control on the level of live weight gain and live weight at the end of the final period.*

In the final period of the experiment, the average daily gain of heifers in the experimental group was 870.2 g, which is 230.1 g or 35.9%, P <0.001 more than the peers of the control group. In bulls of the experimental group, the same figure was higher by 190.1 g or 25.0%, P <0.001 for control peers.

Instead, for the entire period of the experiment in the heifers of the experimental group the average daily gain was 800.3 g, which is 150.1 g or 23.1%, P <0.001 more than the control peers, bulls of the experimental group during this period dominated the control - 310, 0 g or 53.4%, P <0.001. The live weight at the end of the final period in experimental heifers was - 124.8 kg, which is 13.7 kg or 12.3%, P <0,001 more than heifers - analogues of the control group. Meanwhile, as the bulls of the experimental group in the final period had an average live weight of 132.3 kg, which is 11.5 kg or 9.5% more, P <0.001 for control peers who were not administered the experimental drug.

Analyzing the hematological parameters of the blood of bulls of different breeds and them crosses can be noted that the level of hemoglobin and erythrocytes in experimental animals of all experimental groups at the beginning of the experiment was reduced. It should be emphasized that the hemoglobin in animals of the experimental groups was 89.0 - 90.0 g / l, in heifers of the experimental group was increased by 4.4%, at a rate of 90-100 g / l. Erythrocytes, respectively, from - 6.70 to - 6.90 x 10.12 /.l. at the rate of 6.70 -70.00 x 10 12./ l. At the end of the experiment, these indicators stabilized, but more actively this process took place in the heifers of the experimental group.

The number of leukocytes was reduced in all groups, and was 3.50 - 6.80 x 10.9 / liter. In bulls of the experimental group at the end of the experiment, a decrease in the stick of nuclear neutrophils was observed. Analysis of changes in certain forms of leukocytes revealed that the inclusion in the diets of ruminants of experimental groups of the research drug contributed to some reduction in the blood leukogram of the proportion of Escherichia coli. Thus, in experimental heifers compared to the control, this figure decreased by 0.2%, in bulls - by 0.4%, respectively.

At the same time, the share of the segment of nuclear neutrophils decreased: in heifers at the level of 21.5%, in bulls - by 4.05%. The decrease in the proportion of Escherichia coli in the blood was accompanied by an increase in the level of lymphocytes and the difference between the experimental group and the control group was 1.8% and 4.8%, respectively. Monocytes in the amount of 2.80–3.20% were found in the blood of experimental groups and 2.60–2.74% - in the blood of control animals. The share of basophils of peers differed little from each other. However, it should be noted that from the neutrophilic group of granulocytes, myelocytes were not detected in any of the groups.

No significant differences between the young of the compared groups in the morphological composition of the blood were found. However, in the young of the experimental group, the main indicators studied were slightly higher. Thus, in the blood of heifers and bulls that received the test drug, there was a higher number of erythrocytes by 6.5 and 4.7% and the concentration of hemoglobin, respectively - by 3.9 and 8.7%. Quantitative changes in leukocytes were absent, because their content in the blood of young experimental and control groups was approximately the same.

As a result of laboratory tests, the samples were found to be biochemical serum parameters, protein and mineral metabolism in suckling young was within the age-related physiological norm. However, in the nature of changes in hematopoiesis, some differences were observed, which depended on the impact on animals of different feeding conditions. The inclusion in the recipes of the diets of the experimental groups of animals of the research drug helped to increase their biological value and improved the course of metabolic processes in their body. In particular, in heifers and bulls of the experimental groups there was a clear probable difference in the increase in serum total protein content by 10.4 and 12.3%, $P < 0.05$ – $P < 0.001$.

The use of the drug did not have a significant effect on the nature of changes in the mineral and biochemical composition of the blood of young animals of the experimental groups compared with the control. However, the trend of their advantage over peers in the control group remained: the content of total calcium - by 2.0 and 2.4%; inorganic phosphorus - by 4.2 and 12.5%; the activity of the enzymes alanine and aspartate aminotransferases - by 6.7 and 10.5% and 4.9 and 9.7%, the activity of alkaline phosphatase - by 2.2 and 3.7%.

Conclusions.

The prospects of use and the positive effect of the complex preparation "Devivit Selenium" on the intensity of growth of both heifers and bulls of the new population of meat comola Simmental during the weaning period have been established.

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Анотація. *Наведені результати досліджень з розробки і оптимізації складу раціонів годівлі підсисного молодняку м'ясного сименталу в стійловий період та встановлення ефективності їх використання з урахуванням зональних особливостей хімічного складу кормів. Встановлено, що відмінності за споживанням і витратами поживних речовин кормів між піддослідними групами були несуттєвими. Встановлено, що протягом основного періоду досліду в телиць дослідної групи, яким уводили препарат, середньодобові прирости становили – 750,1 г, що на 100,0 г або 15,4 %, P<0,01 більше від ровесників контрольної групи, які знаходилися на кормах господарства без уведення препаратів. Тоді як інтенсивність росту бугайців, яким уводили дослідний препарат протягом основного періоду досліду, становила – 830,2 г, що на 150,1 г або 22,1 %, P<0,001 більше за аналогів контролю. Встановлено, що у заключний період досліду середньодобові прирости телиць дослідної групи становили – 870,2 г, що на 230,1 г або 35,9 %, P<0,001 більше від ровесниць контрольної групи. У бугайців дослідної групи аналогічний показник був більшим за контрольних ровесників на 190,1 г або 25,0 %, P<0,01. За результатами досліджень за весь період досліду в телиць дослідної групи середньодобові прирости дорівнювали – 800,3 г, що на 150,1 г або 23,1 % більше за ровесниць контролю, бугайці дослідної групи за цей період переважали контроль – на 310,0 г або 53,4 %. Визначено, що найкраща оплата корму продукцією була також у теличок дослідної групи і становила – 3,32 к.од., що на 0,51 к. од. або 13,3 % менше від ровесників контрольної групи, при витратах корму на одиницю приросту в бугайців – 3,04 к . од., що на 0,67 к. од. або 18,1 % також менше за контрольну групу з концентрацією обмінної енергії в одному кілограмі сухої речовини телички дослідної групи на 20,5 % і бугайці – на 19,5% поступалися ровесникам контрольної групи. Дослідженнями доведено, що у крові теличок і бугайців, які отримували дослідний препарат, збільшилась кількість еритроцитів на 6,5 і 4,7 %, концентрація гемоглобіну – на 3,9 і 8,7 %, вміст загального білка – на 10,4 і 12,3 %, альбумінів – на 11,4 і 16,4 %, загального кальцію – на 2,0 і 2,4 %; неорганічного фосфору – на 4,2 і 12,5 %; активності ферментів аланін - та аспартатамінотрансфераз – на 6,7 і 10,5 та 4,9 і 9,7 %, активності лужної фосфатази – на 2,2 і 3,7 %, порівняно з контрольною групою.*

Ключові слова*: порода, технологія, телиці, раціон, корм, середньодобові прирости, продуктивність, собівартість.*