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Effects of feed additives "Yoddar-Zn" and "Glimalask-Vet" on the productivity of beef cattle.

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ABSTRACT

Introduction to diet calves of kazakh white-headed breed, raised for meat, fodder additive "Yoddar-Zn» (contain iodine and zinc in organic form), contributed to increase the intensity of their growth (II group), rate's slaughter and the quality of beef.The more high effect of additive has in the complex with additive based on organic acids "Glimalask-Vet» (I group).The calves which was receiving with ration the feed additives, compared to control had body weight bigger by 35.9 and 20.4 kg carcass's weight after slaughter - by 22.27 and 11.47 kg, and the flesh weight – 20.9 and 8.50 kg.Into average sample of the flesh, contents fat was higher by 1.25 and 0.74%, protein - 0.68 and 0.47%, iodine - 39.30 and 26.71%. The animals of experimental groups in the edible portion of the carcass was synthesizing as compared with the control group: more protein by 10.71 and 5.86%, energy - 10.95 to 5.02%. The young animals who received feed additives "Yoddar-Zn" and "Glimalask-Vet" had higher rate's conversion of proteins to muscle tissue by 5.87 to 10.71%, energy - 10.78 and 5.52%. The use feed additives in the rations for young cattle is economically feasible.

Keywords: feed additive, growth rate, body weight, carcass yield, morphological composition of carcasses.

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INTRODUCTION

The solve problem production competitive beef is possible by increasing the number of commodity livestock and create the conditions for maximal realization by animals of their genetic potential productivity [1].The degree of realization genetic potential of animals depends mainly on the level of feeding and balanced rations[2, 3]. To improve balanced rations is appropriate to use a variety of feed additives and biologically active additives, highest effect get by complex their use[4].

Analysis shows that in the feed's rations of beef cattle region of Volga's Lower there is a lack of minerals, such as iodine and zinc.

The studies by Trukhachev et al [2, 9] are showing that organism of animals more fully assimilate minerals in organic form.

The data is evidence the high efficiency of use organic acids as acidifier drinking water [5, 7]. Acidity of organic acids contributes to an increase water consumed and reduce the level of pathogenic bacteria, which coming with the feed's rations, due to changes by pH [6, 8, 10].

MATERIAL AND METHODS

In the paper was studying the effects of feed additives "Yoddar-Zn" and "Glimalask-Vet" in feeding calves. The important components of feed additive "Yoddar-Zn" are iodine and zinc in organic form. "Wet-Glimalask" - glycine, ascorbic acid, malic acid. The developers of feed additives are: "Yoddar-Zn" by "Fille N-Vet Snub" (Moscow), "Glimalask-Vet" by GNU NIIMMP (Volgograd).

To carry out the experiment, in the "Shurupovskoe" Beef Unitof Frolovsky district of Volgograd region were selecting 30 calves of the kazakh white-headed breed at the age 12 months, of which were formed 3 groups of 10 animals. The conditions and total level of feeding for all experimental calves were similar. The animals were keeping in the feedlot separately by groups.

The animals of control group were feeding by standard diet, designed according with norms of feeding to get 950-1000 gram average daily gain.

In the diet for calves of first group (I group) was adding "Yoddar-Zn" at the amount of 100 g per 1 ton of feed and "Glimalask-Wet" at a dose of 400 grams per 1000 liters drinking of water. The calves of second group (II group) in addition to standard diet was adding "Yoddar-Zn" at the amount of 100 g per 1 ton of feed.

Studying the morphometric parameters of calves are had approved by RUSSIAN COMMITTEE FOR BIOETHICS, protocol № 12MBC739 of 03.06.2016 and were carrying out according DIRECTIVE 2010/63 / EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 22 September 2010 on the protection of animals used for scientific purposes.

RESULTS AND DISCUSSION

The calves, which got "Yoddar-Zn" and "Glimalask-Wet" had more higher body weight and growing power.When the calves were taking away off fattening, I and II experimental groups had a live weight greater than control on 35.9 kg, or 7.11% (P> 0.999), and 20.4 kg, or 4.04% (P > 0.999) (Table 1).

The calves of all test groups were characterizing high growth energy. The average daily gain calves, consuming feed additives "Yoddar-Zn" and "Glimalask-Vet" was 1002.78 and 916.11 g, which is more than control on 24.49 (P> 0.99), and 13.73% (P> 0.95). In terms of absolute growth, this difference was 26.5 (P> 0.999) and 19.9 kg (P> 0.999).

When the calves reached 18 months of age, were studying meat productivity and quality meat of experimental calves.

The slaughter calves was conducting at the Volgograd's meat-processing plant "Agro-Invest".

All of calves, selected for the control slaughter, had high fatness. After 24-hours period of fasting, weight of young animals, which were feeding with additives, had been more than control group, on 33.84 (P> 0.999) and 18.32 kg (P> 0.99) (Table. 2).

Slaughter results and morphological structure of carcasses are reflect that the calves which were feeding by "Yoddar-Zn" and "Glimalask-Vet," had more finish weight than control, on 22.37 kg, or 8.34% (P> 0 , 99), and 11.47 kg, or 4.30% (P> 0.95) and carcass yield - 0.59 and above 0.20%. Lard weight larger on 2.40 kg or 15.39% (p> 0.95), and 1.67 kg or 10.71%. Slaughter-weight on 24.67 kg, and 8.73% (P> 0.99), and 13.14 kg, or 4.65% (P> 0.95), slaughter yield - 0.85 and 0.42%.

Boning of carcasses were carrying out after 24 hours of cooling in the refrigerator, the boneless beef yield of calves I and II groups was greater than control, (P> 0.999) on 20.9 kg, or 9.87%, and 8.50 kg, or 3.93% (P> 0.95), the gross fleshing index - higher on 0.28 (P> 0.95), and 0.07.

The analysis of average sample of boneless beef revealed that the dry matter content was greater in calves I and II groups compared to control, on 2.03 (P> 0.99) and 1.23% (P > 0.95) protein - 0.68 and 0.47% fat - 1.25 (P> 0.95) and 0.74%. By the way the boneless beef of calves I and II groups had increased fraction of iodine on 39.30 and 26.71% (Table. 3).

Analysis for chemical composition of the eye muscle revealed the dry matter content, protein and fat is as similar as average sample of boneless beef, but the dry matter content in the muscle of calves I and II groups by the control was more on 1.93 (P> 0.95) and 1.05% fat - 0.13 and 0.07%, protein - 1, 79 (P> 0.95) and 0.97% iodine - at 41.98 and 19.86%.

The content of essential amino acids and their ratio are closely linked with nutritional value of meat. So the meat of calves I and II groups, had essential amino acid tryptophan more than in control, on 15.70 (P> 0.99) and 10.14 mg (P> 0.95), nonessential - hydroxyproline - less on 5.67 (P> 0.95) and 1.65 mg. The ratio tryptophan to hydroxyproline in the meat of calves I and II groups, was more optimal than of control.The weight of edible part of body an animal, which were feeding "Yoddar-Zn" and "Glimalask-Vet," was more than control on 26.6 kg (9.48%; P> 0.95) and 12.12 kg (4.32%; P> 0.95).In the body of calves which were feeding with additives, had been transformed much more protein than in control on 10.71 (P> 0.999) and 5.87%, fat - by 10.78 (P> 0.999) and 5.52% (P> 0.95), the energy - on 10.95 (P> 0.999) and 5.02% (P> 0.999) (Table 4).

Using into the diets for experimental calves, feed additives, had a marked effect on the nutrients conversion rate. Protein conversion ratio by calves I and II groups, was 8.50 and 8.14%, higher than into the control group, 0.61 and 0.20%, and the energy conversion efficiency - on 0.65 and 0.29%.The calves of I group had more protein conversion ratio on 0.35, and energy conversion efficiency - 0.36% than the calves of II group.

Calculations are shown that the use for feeding calves, raised for beef, feed additives "Yoddar-Zn" and "Glimalask-Vet" economically relevant. There is an increase pure gain and a reduction in feed consumption per unit of growth. Lower the price on the beef by 4.2 and 1.7 rubles., and increase profitability level on 7.38 and 4.32% (Table. 5).

Table 1: Dynamics body weight of the experimental calves kg (m = 10)

Age, months	Groups		
	Control	IGroup	IIGroup
12	360,3±0,47	360,7±0,42	360,8±0,55
13	375,4±0,42	386,2±0,61	378,3±0,55
14	406,5±0,47	418,4±0,55	412,2±0,56
15	436,1±0,57	455,5±0,44	443,6±0,68
16	467,7±0,64	490,4±1,08	478,6±0,80
17	493,4±0,75	523,4±1,16	508,7±0,93
18	505,3±0,80	541,2±1,30	525,7±1,01

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Table 2: Slaughter results and morphological structure of carcasses (n = 3)

Indicators	Groups		
	Control	IGroup	IIGroup
Body weight at the Beef Unit, kg	505,33±2,91	541,24±2,40	525,67±3,48
Finish weight, kg	468,33 ±2,73	502,17±2,86	486,65±3,48
Carcass meat,kg	267,13±2,64	289,40±7,94	278,60±3,10
Carcass yield, %	57,04±0,68	57,63±1,44	57,24±0,26
Fat weight, kg	15,60±0,26	18,00±0,53	17,27±0,64
Fat yield, %	3,33±0,05	3,59±0,12	3,55±0,15
Slaughter-weight,kg	282,73±2,43	307,40±7,50	295,87±2,60
Slaughter yield,%	60,37±0,63	61,22±1,37	60,79±0,21
Chilled carcass weight, kg	265,30±1,61	287,31±2,15	273,90±2,28
Boneless beef weight, kg	216,40±1,36	237,30±1,01	224,90±1,42
Boneless beef yield, %	81,60±0,16	82,60±0,23	82,10±0,17
Bone weight, kg	41,40±0,19	43,10±0,21	42,5±0,16
Bones yield, %	15,60±0,06	15,00±0,17	15,5±0,09
Tendons weight,kg	7,50±0,04	6,90±0,03	6,60±0,03
Tendons yield, %	2,80±0,09	2,40±0,01	2,40±0,01
Gross fleshing index	5,23±0,04	5,51±0,03	5,30±0,06

Table 3: Chemical composition of meat (n = 3)

Indicators	Groups		
	Control	IGroup	IIGroup
Average sample of boneless beef			
Moisture, %	68,73±0,23	66,70±0,25	67,50±0,12
The dry matter content, %	31,27±0,23	33,30±0,25	32,50±0,12
Protein, %	18,39±0,16	19,07±0,36	18,86±0,43
Fat, %	11,85±0,35	13,10±0,15	12,59±0,37
Ash, %	1,03±0,02	1,13±0,09	1,04±0,07
Iodine, mg/kg	4,53±0,50	6,31±0,52	5,74±0,80
Eye muscle			
Moisture, %	76,27±0,46	74,34±0,28	75,22±0,49
The dry matter content, %	23,73±0,46	25,66±0,28	24,78±0,49
Protein, %	21,21±0,51	23,00±0,23	22,18±0,61
Fat, %	1,41±0,07	1,54±0,13	1,48±0,15
Ash, %	1,11±0,02	1,12±0,03	1,12±0,04
Iodine, mg/kg	5,54±0,55	7,86±0,39	6,64±0,23

Table 4: The feed conversation into protein and energy of the test animals.

Indicators	Groups		
	Control	I Group	II Group
The edible of body part, kg	280,72±3,16	307,32±2,98	292,84±3,02
Incl.			
off al sand blood	48,72±0,51	52,01±0,34	50,67±0,47
internal fat	15,60±0,28	18,00±0,19	17,27±0,23
Accumulation into the body's tissues:			
Protein, kg	49,69±0,44	55,01±0,50	51,96±0,39
Fat, kg	42,67±0,41	47,27±0,38	44,80±0,35
Energy, MJ	2504,02±34,63	2778,17±21,71	2629,70±20,59
Protein conversion ratio,%	9,41	10,02	9,67
Energy conversion efficiency,%	7,85	8,50	8,14

Table 5: Effects of feed additives "Yoddar-Zn" and "Glimalask-Vet" at meat production

Indicators	Groups		
	Control	I Group	II Group
The absolute gain body weight for a period of experience, kg	145,0	180,5	164,9
Feed intake for 1 kg of gain, ECE	8,0	7,5	7,8
Live weight in 18 months of age, kg	505,3	541,2	525,7
Production inputs, rub.	11108	13058	12211
The cost of live weight gain per 1 kg, rub.	76,6	72,4	74,1
Estimated value, rub.	13920	17328	15830
Profit, rub.	2812	4270	3619
Profitability level,%	25,32	32,70	29,64

CONCLUSION

Thus, the use in the feeding of calves, raised for meat, feed additives "Yoddar-of Zn" and "Glimalask-Vet" allows to increase the intensity of growth, slaughter quality, chemical and biochemical composition of meat, the economic indicators. Using these additives in complex for feeding calves allows getting the maximum effect at meat production.

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