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## Effect Feed Additive "BIO-Extra" Produced By Different Technologies to Beef Production.

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### ABSTRACT

In this work revealed positive impact new feed additive "BIO-Extra" to productivity and quality indicators of meat calves. Best effect is had obtained by using a feed additive, which contained extruded chickpeas, pumpkin-silybum marianum press cake. Animals, which consumed feed additive «BIO-Extra», at the age of 16 months, surpassed by live weight analogues of control 19.0 and 25.0 kg with a significant difference. The calves which were consuming a feed additive with extruded components (chickpeas and pumpkin-silybum marianum press cake) (II group) and as native form (I group), the difference in body weight was 6.0 kg. The average weight gain during the period of experience in the animals I and II experimental groups, was higher than control, by 101.1 and 143.9 g. Control slaughter results revealed that calves of experimental groups compared with control, carcass's weight was higher by 10.9 and 16.5 kg, slaughter weight – 12.0 and 18.0 kg, carcass yield - higher by 0.40 and 0.92% and slaughter yield – 0.59 and 1.23%. Flesh weight of carcasses from calves consuming feed additive was higher by 10.7 and 17.7 kg, and its yield higher by 0.75 and 1.65%. The animals, which consumed feed additive, has improved chemical composition of meat. Average sample flesh of carcasses the dry matter contained more than analogues, 1.66 and 2.64%, protein - 0.73 and 1.05, fat - by 0.83 and 1.46%. The meat from calves of experimental groups has increased content selenium by 30.75 and 30.36, iodine – by 36.59 and 47.16%. Biochemical analysis revealed that the eye muscle from calves has content of essential amino acid tryptophan was higher by 5.26 and 5.43%, and protein quality index – by 0.50 and 0.58. Introduction to the diet for calves feed additive has increased the culinary and technological characteristics of meat. Water retention capacity of muscle increased by 1.16 and 0.52%.

**Keywords:** feed additive, extruding, calves, growth rate, meat productivity, chemical and biochemical composition of meat and fat tissue.

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## INTRODUCTION

The productivity of animals and quality products derived from them, are connected with feeding level, adequate diet, bioconversion nutrients of feed [1, 4, 7].

The research works of researchers [6, 8] are reported about impact to productivity of animals bioavailability nutrients of feed, but the bioavailability nutrients of feed has properties change by technological methods to production and prepare them for feeding animals.

One of these methods is extrusion [3, 5]. The extrusion processing is substantially increased nutritional and biological value of feed, because the corn starch is hydrolyzed on monosaccharide and dextrin. This increases the content of soluble by 5-8 times, saved nutritional value of protein and reduce amount or destroy anti-nutritional compounds (urease, trypsin, protease inhibitors). The nutrients of feed becomes more accessible to digestive juices and enzymes, it is better digested and assimilated.

## MATERIALS AND METHODS

In this research paper were studying the effect of feed additive "BIO-Extra", which was composed of chickpeas, pumpkin-silybum marianum press cake, drug DAPS-25, feed additives "Yoddar-Zn" and "Glimalask-Vet", on meat productivity and beef quality.

There is produced 2 batch feed additive "BIO-Extra". First embodiment of chickpeas and pumpkin-silybum marianum press cake in native form, in the second – by extrusion.

The studies were conducting in OJSC "Shurupovskoe" Frolovsky district of Volgograd region. There are had formed 3 groups calves of Kazakh white-head breed in the age of 10 months by 10 goals each. Calves the control group were feeding by general diet, to get 1100-1200 g average daily gain weight.

In the diet for calves I and II experimental groups, were adding feed additive "BIO-Extra" by 400 g per head instead relevant part of feed. The calves of I experimental group were receiving chickpeas and pumpkin-silybum marianum press cake in native form, II - by extrusion.

Young animals of experimental groups contained loose-separately for groups on irremovable bedding. Feed supplements fed to animals as a part of mixed fodders.

## RESULTS AND DISCUSSION

By start of experience the difference the weight of calves were minimal - within the error. At the age of 12 months young animals I and II experimental groups has indices live weight higher than control, by 12.2 kg (3.70%) ( $P > 0.99$ ) and 13.2 kg (4, 00%) ( $P > 0.99$ ), the age of 14 months - 18.7 kg (4.74%) ( $P > 0.999$ ) and 22.2 kg (5.63%) ( $P > 0.999$ ) and the age of 16 months - 10.0 kg (4.20%) ( $P > 0.999$ ) and 25.0 kg (5.52%) ( $P > 0.999$ ). At the same time calves from II experimental group at the age of 16 months, exceeded the analogues of I experimental group by live weight by 6.0 kg (1.28%) ( $P > 0.95$ ) (Table 1).

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

Age, months	Groups		
	Control	I Group	II Group
10	267,3±1,06	268,1±1,21	266,4±1,14
11	298,6±1,20	301,7±1,34	301,4±1,17
12	330,2±1,38	342,4±1,28	343,4±1,22
13	362,7±1,29	378,8±1,39	381,0±1,40
14	349,6±1,48	413,3±1,23	416,8±1,28
15	424,4±1,26	444,7±1,30	449,6±1,70
16	453,0±1,30	472,0±1,46	478,0±1,33

Absolute growth of calves from experimental groups during the experience were higher than the analogues of control by 18.2 kg (9.80%) ( $P > 0.99$ ) and 25.9 kg (13.95%) ( $P > 0, 99$ ) (Table 2).

**Table 2: Absolute weight gain, kg**

Age, months	Groups		
	Control	I Group	II Group
10-11	31,3±1,27	33,6±1,19	35,0±0,28
11-12	31,6±1,08	40,7±1,36	42,0±1,20
12-13	32,5±0,79	36,4±0,94	37,6±1,15
13-14	31,9±1,50	34,5±1,39	35,8±1,53
14-15	29,8±0,91	31,4±1,20	32,8±0,86
15-16	28,6±1,25	27,3±1,37	28,4±1,48
10-16	185,7±2,86	203,9±3,12	211,6±2,64

It is had noted that the highest absolute weight gain experimental calves were aged of 11-13 months. The monthly absolute weight gain varied by control group of animals from 28.6 to 32.5 kg, I group - from 27.3 to 40.7 and II group - from 28.4 to 42.0 kg.

Meat productivity was studying based on results of control slaughter. Control slaughter was carrying out in meat-packing plant "Agroinvest". Young animals selected for slaughter, before being sent to meat-packing plant and a slaughterhouse were weighed. Loss body weight of calves during transport and pre-slaughter keeping amounted for control group, 23.9 kg (5.26%), I group - 24.9 kg (5.28%) and II group - 24.8 kg (5.20 %).

The slaughter is revealed that mass of carcasses I and II experimental groups was higher than control by 10.9 kg (4.50%) ( $P > 0.95$ ) and 16.5 kg (6.81 %) ( $P > 0.99$ ), and yield of carcasses - by 0.40 and 0.92%. The slaughter weight of calves was more by 12.0 kg (4.72%) ( $P > 0.95$ ) and 18.1 kg (7.12%) ( $P > 0.99$ ), and slaughter yield - by 0.59 and 1.23%.

Results of boning revealed that mass of flesh in the carcasses animals consuming the feed additive "BIO-Extra", was more than control group by 10.7 kg (5.47%) ( $P > 0.95$ ) and 17.7 kg (9.05%) ( $P > 0.99$ ) and yield of flesh - higher by 0.75 and 1.65%. Yield bones in the carcasses of calves from control exceeds experimental groups by 0.39 and 1.32%.

Thus, the fodder additive has had a positive impact on morphological composition carcasses of calves. This effect was higher in the group of animals treated with additive, which included chickpeas and pumpkin-silybum marianum press cake by extruding.

During the study was study effect of feed additive "BIO-Extra" on content iodine and selenium into meat, as it is include organic selenium and iodine. It had revealed that feed additive enhanced content these elements into the meat. The increase content selenium into meat of calves I and II experimental groups compared with the control was 30.75 and 39.36%, iodine – 36.59 and 47.16% (Table 3).

**Table 3: The contents of iodine and selenium into the average sample of meat**

Indicators	Groups		
	Control	I Group	II Group
Mass fraction of selenium mcg / kg	7,840±0,113	10,251±0,305	10,926±0,240
Mass fraction of iodine, mg / kg	0,123±0,026	0,168±0,028	0,181±0,031

Thus, feed additive "BIO-Extra" increase mass fraction of dry matter, protein, fat, selenium and iodine into the meat.

Water retention capacity meat from calves consuming feed additive "BIO-Extra" was higher than control by 1.16 ( $P > 0.99$ ) and 0.92% ( $P > 0.95$ ). Culinary technology index (CTI) of meat from calves of experimental groups was higher by 0.15 and 0.14.

## CONCLUSION

Use in feeding calves, feed additive "BIO-Extra" is economically feasible (Table 4).

**Table 4: Economic efficiency of beef production**

Indicators	Groups		
	Control	I Group	II Group
Absolute growth, kg	185,7	203,9	211,6
Production costs, rubles	14206,5	15092,3	15452,2
The cost price of 1 kg of growth, rubles			
Estimated sales revenue, rubles	18198,6	19982,2	20736,8
Profits derived from the sale, rubles	3992,1	4889,9	5284,6
The level profitability of meat production, %	28,10	32,40	34,20

In the experimental groups per a calf, it was more profit than control by 897.8 and 1292.5 rubles. Level of profitability for beef production was higher in these groups by 4.30 and 6.10%.

Should be notice that use that is more efficient feed additive "BIO-Extra" in extruded form.

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