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The Mountain Pasturing Of Cattle Plus Feeding Them On A Plain – Improving The Efficiency.

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ABSTRACT

The vast majority of entrepreneurs who uses mountain pastures, apply the practice of selling livestock after the completion of pasturing without subsequent fattening, as this issue in our region has not been studied and there is no experience in organizing such an event. The purpose of our work is to prove and develop the principal methods of increasing beef production on the basis of application of pasturing technology with subsequent intensive feeding of different breeds of bulls for two months and to calculate the relative economic efficiency of both cycles of summer keeping of the young cattle on the mountain pastures and in the conditions of the complex. While staying in the mountain pastures our experimental animals had the opportunity to pasture around the clock. During the whole time of grazing the bulls had an access to the water source. As well, they were given feeding concentrates in bad weather, when the animals grazed badly and did not eat till full. There were from 2 to 3 such days in a week. Salt in wooden feeders constantly laid in the cattle camp. The cattle received chalk together with the salt. There were no shelters for the animals in the camp. Upon returning from the mountain pastures, those bulls of both breeds which were not intended for intensive feeding have been implemented at the meat in the amount of 40 heads and their average live weight was: the Kalmyk – 416 kg; brown Swiss Breed – 401 kg. The bulls in the amount of 42 heads that might not be sold for slaughtering, were put on intensive feeding for two months in the conditions of the complex. There were typical conditions for them in the cattle corral by 10-11 heads. It is established that the use of mountain-pasture keeping of young cattle is a very effective activity in cattle breeding. Carrying out the final intensive feeding in a complex or a farm for 2 months after not intensive feeding on mountain pastures is an economically-effective measure, especially for specialized young meat cattle.

Keywords: pasturing, feeding, Kalmyk breed, Swiss breed, meat productivity, slaughtering qualities.

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INTRODUCTION

Meat consumption per one person remains one of the main indicators of the welfare of the population and the level of the state economy. The Ministry of Health of the Russian Federation recommends that the consumption of meat and meat products must be 70-75 kg for a person per a year, including beef - 25 kg. According to FAO, in most developed countries meat consumption for a person per a year is more than 75 kg [1].

Cattle are an important source of meat resources. It is necessary to use all the reserves of the country and the industries to increase beef production and provide the population with high-quality food [2-6].

The development of domestic beef cattle breeding creates conditions for the development of rural areas, which at the same time will solve one of the strategic objectives of the state policy. Food security, the competitiveness of the Russian economic sector and the welfare of citizens will at the same time, be ensured.

The most capable among all the branches of agricultural production is meat cattle breeding, it helps to neutralize the difficulties with the creation of jobs and the formation of sustainable development of small rural settlements with a population of less than 200 inhabitants, which account for more than 70% of all rural settlements in the Russian Federation [7,8].

The expansion of the specialized beef cattle breeding area requires genetic diversity, causing a real need to create highly productive purebred and crossbred herds, characterized by good adaptability to traditional and intensive technologies in specific conditions [9-14].

Favorable conditions for the development of this industry are available in the foothills and mountains of the North Caucasus. The area of agricultural land is 6745,4 hectares, including natural hayfields and pastures – 4610,5 hectares or -68,4% of the farmland area.

The vast majority of entrepreneurs using mountain pastures, apply the practice of selling livestock after the completion of pasturing without subsequent feeding, as this issue in our region has not been studied and there is no experience in organizing such an activity.

The purpose of our work is to prove and develop the principal methods of increasing beef production on the basis of application of pasturing technology with subsequent intensive feeding of different breeds of bulls for two months and to calculate the relative economic efficiency of both cycles of summer keeping of the young cattle on the mountain pastures and in the conditions of the complex.

In accordance with this goal, we have set the following tasks:

- to study the dynamics of bulls' growth in different technological and age periods;
- to determine the efficiency of pasturing bulls of Kalmyk and Swiss breeds on natural mountain pastures with minimal consumption of concentrated feed;
- to determine the cost-effectiveness of the technology of pasturing cattle followed by intensive feeding in the complex for two months;
- to determine the cost of feed per unit of growth in different technological and age periods;
- to determine the total cost of feed for technological and age periods;
- to assess meat productivity of calves of the experimental bulls;
- to study the morphological composition of carcasses and its individual parts;
- to give an economic assessment of the effectiveness of pure pasturing and pasturing followed by intensive feeding for two months.
- give suggestions to the production on the basis of our own research.

MATERIALS AND METHODS

During their stay in the mountain pastures, the experimental animals had the opportunity to pasture around the clock. Despite this, the bulls themselves after 22 hours started to move in the direction of the camp and in 23 hours they already laid down and rested until dawn, then started pasturing again.

During the whole time of grazing the bulls had an access to the water source. As well, they were given feeding concentrates in bad weather, when the animals grazed badly and did not eat till full. There were from 2 to 3 such days in a week. Salt in wooden feeders constantly laid in the cattle camp. The cattle received chalk together with the salt. The feeders with salt were protected from rain. There were no other shelters for the animals in the camp.

Upon returning from the mountain pastures, those bulls of both breeds which were not intended for intensive feeding have been implemented at the meat in the amount of 40 heads and their average live weight was: for the Kalmyk breed – 416 kg; brown Swiss breed – 401 kg. The bulls in the amount of 42 heads that might not be sold for slaughtering, were put on intensive feeding for two months in the conditions of the complex.

There were typical conditions for them in the cattle corral by 10-11 heads, which were chosen according to their live weight, body size and their behavior. We have made the diet of winter feeding as the feeding was carried out after the pasturing period. Feed consumption for the period of intensive fattening is presented in table 1.

The entire period of feeding was divided into preliminary and main periods, respectively 10 and 50 days.

The feed consumption by bulls was monthly taken into account by groups for two shift days by weighing them before distribution and collecting their residues and following weighing.

According to the calculated data, on average, each experimental bull consumed 28,5 kg of grass from mountain pastures per day during the whole period of pasturing.

During the period of intensive feeding bulls of both breeds were fed the same amount of feed, which is reflected in table 1.

In the structure of fodder, coarse and juicy food occupied about 40%, concentrates – 12,5%, the share of pasture food was more than 35%. Observations of animals during the pasturing period showed that the animals most eagerly ate grass at cool evening time, especially before returning to the camp. Almost half of the daily value of the grass was eaten by them in the evening.

Table 1: Feed Consumption for the Period of Intensive Feeding, kg / head

Fodder	Swiss		Kalmyk	
	Preliminary period	Main period	Preliminary period	Main period
	Number of Days in Period			
	10	50	10	50
Cereal hay of motley grass	10	75	10	75
Oats traw	50	250	50	250
Cornsilage	50	250	50	250
Molasses	12	60	12	60
Concentrated fodder corn +barley +oats	25	125	25	125
Salt	0,45	2,25	0,45	2,25
Chalk	0,4	2,0	0,4	2,0

Total energy feed unit	62,12	320,6	62,12	320,6
Dry substances, kg	87,03	456,4	87,03	456,4
Digestible protein	5,6	29,42	5,6	29,42
The Content of energy feed unit in the daily diet	6,21	6,41	6,21	6,41
The content of digestible protein in the daily diet, g	560	588,4	560	588,4
The digestible protein in (g) to 1 energy feed unit	90,17	91,79	90,17	91,79

In the period of intensive feeding we didn't observe any significant difference between the bulls of various breeds. It was noted that the bulls of the Kalmyk breed ate all kinds of fodder with greater intensity, but they made more frequent and longer breaks in eating food than those of the brown Swiss breed. This is due to the fact that the animals of the Kalmyk breed have found greedy habits from nature, in semi-wild habitat and poor food allowance in the process of evolution of the breed.

The Bulls of the Swiss breed received food longer than others so they saturated and rested respectively longer, than those of the Kalmyk breed. At night, the bulls of the Kalmyk breed showed more concern than the Swiss bulls.

RESULTS

The level of feeding and high quality of feed, especially among bulls on intensive feeding, provided a good development of the entire experimental livestock. At the same time, the breed and its specialization had a positive impact on the dynamics of live weight and the size during all periods of growth, cultivation and feeding (table 2). After the removal from pasturing the average live weight of bulls which were not intended for subsequent intensive feeding was: for Swiss breed-401kg; Kalmyk breed-416kg; what about those which were intended for subsequent intensive fattening - bulls of Swiss breed it was - 400 kg; Kalmyk breed - 410 kg.

The same indicator after the removing from feeding was: for Swiss breed – 474 kg; for Kalmyk breed - 501 kg. The average daily gain of bulls, which were not intended for subsequent fattening removed from the feeding, were: Swiss breed – 915 g; Kalmyk breed -980 g; and for those, intended for subsequent intensive fattening-Swiss breed-909 g; Kalmyk breed – 941 g.

At the same time, average daily gains of bulls removed from pasturing grounds and subsequent intensive feeding as well, made: Swiss breed – 990 g; Kalmyk breed – 1092 g. As a result, the superiority in average daily gain of bulls removed from feeding to the same indicator after the removal from pasturing made: Swiss breed – 8,9%; Kalmyk breed – 16,0%.

After slaughtering the experimental bulls, the results showed that after intensive feeding conducted in accordance with the scheme of the experience, the exit carcass increased with the Swiss breed - from 51,8% to 53,9% and with the Kalmyk breed - from 52,14 to 54,5% while the reduction of bones content: Swiss from 21,1% to 19,2%, while bulls that didn't get intensive feeding after pasturing were hung over with the reduction of the carcass by 51,8%, which is almost by 3% less than with the final intensive feeding. This pattern was observed in the bulls of both breeds involved in the experiment.

Table 2: The Dynamics of Live Weight and Bullish Gain, n=20

Indicators	During pasturing		During pasturing and feeding	
	Swiss Breed	Kalmyk Breed	Swiss Breed	Kalmyk Breed
Live weight:				
When putting on experience, kg	260	265	260	265
After the removal from pasturing, kg	401	416	400	410
After the removal from experience,	401	416	474	501

kg				
Duration:				
Pasturing, days	154	154	154	154
Feeding, days.	-	-	62	62
Average daily gain:				
During the pasturing, g	915	980	909	941
During the pasturing and feeding, g	-	-	990	1092
The pasturing and feeding in (%) to pasturing	-	-	8,9	16,0

Along with that, it is necessary to note the differences, both on live weight, and on level of meat productivity among the breeds and among the groups which have passed intensive feeding and haven't passed it. So the average daily gains of bulls which have undergone final intensive feeding was higher: for Swiss breed – 75 g, for Kalmyk breed – 151 g. The conclusion is that the conduction of the final feeding in the complex after the pasturing season is economically viable because it promotes the increase in meat productivity of feeded livestock.

Table 3: The Results of Experimental Livestock Slaughtering After Final Feeding, n=5

Indicators		Swiss breed		Kalmyk breed	
		After pasturing	After feeding	After pasturing	After feeding
		M ± m	M ± m	M ± m	M ± m
Pre-slaughtering live weight, kg		401±6,0	474±5,6	416±5,8	501±7,2
Weight, kg	carcass	207,9±3,1	255,4±4,2	216,9±3,5	273,0±5,1
	Internal fat	9,9±0,9	12,2±0,7	12,56±0,5	15,83±0,8
	all	217,8±1,8	267,6±2,0	229,46±1,3	288,83±1,6
Slaughtering output, %	carcass	51,85	53,9	52,14	54,5
	internal fat	2,47	2,57	3,02	3,16
	all	54,3	56,47	55,16	57,66
Skin weight, kg		30,8±0,3	35,5±0,2	31,6±0,7	38,5±0,6

This conclusion was confirmed by the results of the morphological composition of bulls' carcasses after the final feeding and after pasturing.

Table 4: The Morphological composition of bulls' carcasses after pasturing and final feeding, n=5

Indicators			Swiss breed		Kalmyk breed	
			After pasturing	After pasturing and feeding	After pasturing	After pasturing and feeding
			M ± m	M ± m	M ± m	M ± m
The weight of the carcass, kg			217,8±2,4	267,6±2,3	229,46±2,8	288,83±2,7
contents in the carcass	bones	кг	45,95±0,32	51,37±0,41	49,10±0,45	53,72±0,36
		%	21,1	19,2	21,4	18,6
	meat	кг	166,68±2,5	210,06±1,9	174,96±2,6	229,04±2,3
		%	76,53	78,5	76,25	79,3
	tendons	кг	5,16±0,01	6,15±0,01	5,39±0,02	6,06±0,02
		%	2,37	2,3	2,35	2,1
The coefficient of meat fullness			3,9±0,03	4,2±0,04	4,1±0,02	4,4±0,03

The change in the content of bones and meat in the carcasses of bulls slaughtered after pasturing and after the final feeding, has also occurred in favor of the bulls which have passed the final feeding and at the same time, the best results were in the bulls of the Kalmyk breed.

The indicators of meat fullness in the carcasses were in favor of livestock which have assed feeding. In the carcasses of the Kalmyk breed bulls the coefficients of meat fullness were higher than in the carcasses of the Swiss bulls.

Table 5: The Economic Efficiency of the Final Intensive Feeding of Bulls After Pasturing

Indicators	Swiss breed		Kalmyk breed	
	Pasturing	Pasturing + feeding	Pasturing	Pasturing + feeding
Live weight of 1 head at the beginning of the experiment, kg	260	260	265	265
Live weight of 1 head at the end of the experiment, kg	401	474	416	501
Gross growth of 1 head, kg	141	214	151	236
The cost of a 1 C of gain in (RUB)	12115	11927	11072	11000
Sales price of 1C of gain in (RUB)	13750	13750	13820	13946
Profit from 1C grain in (RUB)	1635	1823	2748	2946
Profit from 1 head in (RUB)	6556,3	10063,0	11431,0	14759,0
The levelofprofitability, %	13,49	15,2	24,8	27,09
Pasturing and feeding +/- to pasturing		+1,79		+2,29

Table 5 shows that the profitability of Kalmyk bulls’ meat production and sale is higher than that one of bulls of the Swiss breed. Moreover, in terms of profitability of production, the bulls that have passed the final intensive feeding, surpassed their peers from the compared group: Swiss breed – by 1,79%; Kalmyk breed – by 2,29%.

CONCLUSION

1. The use of the mountain pasturing of young cattle is a very effective measure in animal husbandry.
2. Carrying out the final intensive feeding in a complex or a farm for 2 months after not enough intensive feeding on mountain pastures is a cost-effective measure, especially for specialized meat bulls. This activity increases the meat productivity of livestock and their meat production. In such a way the morphological indicators of obtained carcasses are improved.

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