

Research Article

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**Kazakh White Breed Bulls Assessment by Quality of Progeny and Bulls
Test in Own Productivity**¹Kuat Nurgazy, ²Kyrgyzbai Begembekov,³Gulzat Gabitand and ⁴Zhanat Iskakova,¹Full Professor, Doctor of agricultural sciences,²Full Professor, Doctor of agricultural sciences,

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Kazakh National Agrarian University, Almaty, Kazakhstan**ABSTRACT**

The assessment of Kazakh white breed seed bulls by quality progeny and tests on their own productivity and test-use on breeding farm "Bagration-2» Ulan district of East Kazakhstan region. Installed correctly assess of seed bulls on the quality of progeny by determining and comparing the integrated selection index, even at relatively equal rates on individual attributes of selected themselves like bulls evaluated and selected mares to him, and in their progeny.

Keywords: kazakh white breed, seed bulls, progeny, improver, neutral, disimprove, complex index, correlation, profitability.

INTRODUCTION

The complex selection and stock breeding on productivity cattle of meat direction based on traditional methods of cultivation - the purposeful selection, improve the selection of a preliminary assessment of breeding animals for quality progeny. Among these methods of improving breeds there are important two-step assessment of the breeding value of seed bulls, by the results will be possible to solve a number of selection issues, which contributes to the consolidation and the breed securing of economic-useful features in a number of generations. Thus, the efficiency of cattle is largely dependent on the presence of the required quality of animals [1]. According to the data of the Ministry of Agriculture of the Republic of Kazakhstan on 01.01.2016, in Kazakhstan the number of all cattle totaled are 6 065 500 heads, including breeding stock totaled - 652,198 heads, or 10.8% (including breeding stock 291 114 heads or 44.6%), including breeding animals for meat - 393 033 heads or

60.3% of the total breeding stock (including breeding stock 178,422 heads, or 45.4% of the number of breeding animals of meat production). Among the breeding animals of meat production are 223 994 heads or 57.0% (including breeding stock 103,427 heads or 46.2%) of animals refers to the Kazakh white breed. Comparing with other regions, the greatest number of animals of the Kazakh white breed are concentrated in the East Kazakhstan region - 37 499 heads, or 16.7% of all breeding animals of the Kazakh white breed (including breeding stock 15,332 head or 40.9%) [2]. According to these data we can see the obvious urgency of improving the productive and breeding qualities of Kazakh white breed cattle in the country and especially in the East Kazakhstan region.

CONDITIONS, MATERIAL AND METHODS.

The experimental part of research we conducted in one of the large farms of the East Kazakhstan

region - in "Bagration-2» Ulan district - breeding plant on Kazakh white breed cattle. Testing and evaluation of Kazakh white breed seed bulls by the quality of progeny and testing on their own productivity were conducted in two stages - stage of testing and evaluation of seed bulls for progeny and testing stage on their own productivity under the stable system control. Each controllable seed bulls and evaluation of the quality of progeny, on the principle of analogues secured 50 purebred cows (other than his daughters) 4 years of age, meet the Class I requirements.

In order to obtain the same age steers and heifers were selected cows that were inseminated within a month. The most optimum time of insemination was considered - May-June months. Carrying out insemination in these months given the opportunity to test calves in the stall period, the best of them, identified on the basis of tests on their own productivity, bring to mating and in the next year to assess the quality of the progeny. Under this system seed bulls up to 3-3.5 years of age will have two-stage genotypic evaluation of their own productivity and the quality of the progeny. [3] These calves up to 8 months of age, grown together with cows on full suction. After weaning calves from cows selected by normally 20 steers developed by each assessed seed bulls. The bulls, whatever reasons, severely stunted (not meeting the overall development of the Class I requirements) were not put to the test. After weaning from cows all selected calves were transferred to sections of the equipped room with the presence of individual cells allowing them separately to feed and keep a record of feed palatability. Next to this rooms were free-range inns, which also organized feeding and watering of calves. Assessment of Kazakh white breed seed bulls (3 animal units) by progeny carried out in a conventional manner. A common technique in meat cattle breeding of bulls genotype evaluation includes the results of tests on their progeny growth rate and feed cost per 1 kg of a gain control for the period of growing from 8 to 15 months., live weight and lifetime forms assessment of meat at the age of 15 months. Intensive cultivation during the test

on their own productivity steers were conducted to 15 months of age. The level of diet and feeding of tested calves were at the rate to the end of the test period the live weight of tested calves was not lower class elite-record requirements. In order to obtain reliable data on breeding quality check and evaluate sires for progeny, by testing on their own productivity of calves, steers tested were grown in optimal conditions, and exactly the same feeding and, for comparison of the results obtained within the same economy. The feeding ration includes high-quality feeding - hay, haylage and concentrate feed with a specific weight, respectively 20-25% coarse and succulent fodder and 50% concentrates of the total nutritional value. For watering calves used drinkers group, in the cold season with the heated water. The results of the testing and evaluation of bulls for progeny testing by the quality and productivity of their own calves, obtained from the control growing steers tested and evaluated sires, were the basis for the analysis of performance options by parental pairs selection. Identify the best combinations of parental pairs are recommended for use in further breeding work to improve the level of productivity of Kazakh white breed animals on farm «Bagration-2».

Testing and evaluation of bulls on progeny, on their own productivity by penning held from 8 to 15 months of age. During the tests on their own productivity of calves from 8 to 15 months of age was determined by the following indicators:

- live weight - by weighing the individual at the end of each month, in the morning before feeding, and at 15 months of age - weighing 2 days related to the calculation of the average mass;
- average daily gain of live weight from 8 to 15 months;
- the amount of eaten feed - by monthly (for two adjacent days) weighing of special feeds and their residues;
- the level of development of meat forms on 60-point scale at the age of 15 months.

When tested on their own productivity steers in a stabling take into account the following indicators:

- 1) growth rate for the period of breeding and fattening of 8 to 15 months of age;
- 2) feed cost per 1 kilogram (hereinafter - kg) growth for the period from 8 to 15 months of age;
- 3) live weight at 15 months of age;
- 4) meat form at 15 months of age.

Comprehensive Index consists of private breeding index (U1) on live weight at the age of 15 months, the average daily gain of 8 to 15 months, evaluation of meat forms at the age of 15 months., Feed Cost per 1 kg of growth for the period of control growing from 8 to 15 months , calculated according to the formula:

$$y_1 = \frac{x_1}{\bar{x}}$$

where:

x_i —phenotypic trait expression of each individual animal, \bar{x} —the arithmetic mean value of each attribute.

RESULTS AND DISCUSSION.

In the conventional system of young bulls tests on their own productivity - the quality of the progeny, the main breeding traits largely determine the breeding value and the resulting value of the complex index were - live weight and average daily gain. Theory and practice established advantage genotypes of Kazakh white breed with high body weight in a different, especially at a young age. Therefore, breeding of Kazakh white breed of beef cattle is focused mainly on the high rates of average daily gain in different age periods of their growth and development. [4] Along with this, it is important to improve the Kazakh white-headed breed of utilizing diversity within among the progeny of different sires. [5]

Objective evaluation of the genetic potential and increase the accuracy of selection herd replacements for the reproduction of the herd - a pledge of effective selection and breeding work in beef cattle [6].

Therefore, the aim of our research was - definition of the difference evaluation of the Kazakh white breed genotype of breeding animals, by raising bulls assessment experiment is virtually identical both on the exterior, constitution and by live weight, precocity and other visible of selected characteristics, conducted in the same household conditions. Table 1 shows clearly that the superiority of live weight in 8 months steers offspring of seed bull № 267-189867855 over peers was 4.5 - 7.9 kg or 2.0 - 3.5%; ($t_d = 0,32 - 0,57$; $P < 0.95$) and, in turn, on the superiority of live weight in 8 months steers offspring of seed bull № 341-189867854 over their peers from bull-producer number 60- 189867858 was 3.4 kg or 1.52%; ($t_d = 0,25$; $p < 0.95$).

This trend continued in the following age periods steers offspring from different manufacturers evaluated and intergroup differences with significantly increased. Thus, the superiority of live weight at 11 months, calves, offspring of the seed bull № 267-189867855 over their peers from the bulls and № 341-189867854 № 60-189867858 was, respectively, 6.5 and 16.3 kg, or 2, 2 and 5.8%; ($t_d = 0,35$ and $0,70$; $P < 0.95$) and, in turn, on the superiority of live weight at 11 months, calves, offspring of the seed bull № 341-189867854 over their peers from seed bull number 60-189867858 was 9.8 kg or 3.5%; ($t_d = 0,54$; $P < 0.95$).

Table 1 - Progeny growth dynamics of bulls evaluated on the «Bagration-2» farm

Individual # of tested bulls	Seed bulls indicators				
	n, haed	options, unit	Live weight in different age		
			8 month.	11 month.	14 month.
267-189867855	20	$\pm m_x$, kg	231,1 \pm 10,0	297,3 \pm 13,2	371,1 \pm 16,8
		δ , kg	45,1	59,2	75,0
		C_v , %	19,5	19,9	20,2
341-189867854	20	$\pm m_x$, kg	226,6 \pm 9,9	290,8 \pm 13,0	366,0 \pm 16,5
		δ , kg	44,2	58,0	75,0
		C_v , %	19,5	20,0	20,2
60-189867858	20	$\pm m_x$, kg	223,2 \pm 9,7	281,0 \pm 12,5	361,0 \pm 16,3
		δ , kg	43,4	55,9	72,27
		C_v , %	19,4	19,9	20,2

By the age of 14 months, the descendants of all the evaluated bulls gained enough live weight and average live weight of calves of different groups was in the range 361-371 kg. This trend observed in previous periods of age on average performance of live weight of calves offspring from different manufacturers evaluated, also survived, but between-group differences in this slightly decreased in numbers. For example, the superiority of live weight in 14 months, calves, offspring of the seed bull № 267-189867855 over their peers from the bulls and № 341-

Table 2 - Bulls progeny results

Characteristic	Options, Unit	Indicator steers progeny of evaluated bulls		
		№ 267-189867855 (n=20heads)	№ 341-189867854 (n=20heads)	№ 60-189867858 (n=20heads)
Live weight in 8 months.	$\pm m_x$, kg	231,1 \pm 10,0	226,6 \pm 9,9	223,2 \pm 9,7
	δ , kg	45,1	44,2	43,4
	C_v , %	19,5	19,5	19,4
Live weight in 15 months.	$\pm m_x$, kg	440,0 \pm 20,0	420,7 \pm 19,1	400,4 \pm 18,2
	δ , kg	89,6	89,6	81,3
	C_v , %	20,4	20,4	20,3
Average daily growth from 8 to 15 months.	$\pm m_x$, g	995 \pm 27,8	924 \pm 27,3	844 \pm 22,3
	δ , g	124,3	122,0	99,6
	C_v , %	12,5	13,2	11,8
Feed costs	$\pm m_x$, unit	7,3 \pm 0,61	7,6 \pm 0,59	8,0 \pm 0,57
	δ , unit	2,71	2,65	2,56
	C_v , %	37,2	34,8	32,0
beefiness	$\pm m_x$, point	55,8 \pm 1,71	53,5 \pm 1,60	52,6 \pm 1,58
	δ , point	7,6	7,2	7,1
	C_v , %	13,7	13,5	13,4
Complex breeding index	$\pm m_x$, point	103,8 \pm 1,51	99,1 \pm 1,49	97,3 \pm 1,52
	δ , point	6,75	6,63	6,81
	C_v , %	6,5	6,7	7,0
	class	Elita record	Elita	Elita

Descendants bull № 267-189867855 characterized by the largest daily gain for the duration of the test - 975 g and exceeded the value of this indicator offspring from sires and № 341-189867854 № 60-189867858, respectively, 71 and 151 grams, or 7.7 and 17.9%; ($t_d = 1,82$; $P < 0.95$ and $t_d = 4,24$; $P > 0.99$) and, in turn, superiority in average daily gain of calves, offspring of the seed bull № 341-189867854 over peers by bull the manufacturer is number 60-189867858 was 80 g or 9.5%; ($t_d = 2,27$; $P > 0.95$). Feed costs per 1 kg of live weight gain of offspring were assessed bulls quite high rates and the arithmetic mean value of this feature in bulls of different groups was in the range 7.3-8.0 unit. This trend is observed on the average performance of live weight at 8 and 15

189867854 № 60-189867858 was respectively 5.1 and 10.1 kg, or 1.4 and 2.8%; ($t_d = 0,22$ and $0,43$; $P < 0.95$). And, in turn, on the superiority of live weight in 14 months, calves, offspring of the seed bull № 341-189867854 over their peers from seed bull № 60-189867858 was 5.0 kg or 1.4%; ($t_d = 0,22$; $P < 0.95$).

Established differences in terms of live weight of calves offspring from different manufacturers were evaluated due to the unequal growth rate (Table 2).

months, and the average daily gain of calves offspring from different manufacturers evaluated in the study period, is preserved, but between-group differences in this slightly decreased in numbers. For example, the superiority of the feed cost per 1 kg of live weight gain of calves, offspring of the seed bull № 267-189867855 over their peers from the bulls and № 341-189867854 № 60-189867858 was respectively 0.3 and 0.7 k.ed. or 4.1 and 9.6%; ($t_d = 0,35$ and $0,83$; $P < 0.95$). And, in turn, on the basis of superior offspring calves from seed bull № 341-189867854 over their peers from seed bull № 60-189867858 was 0.4 feed units or 5.2%; ($t_d = 0,49$; $P < 0.95$).

The sons of the seed bull № 267-189867855 had expressed to the Kazakh white breed of beef

cattle body type, it has a wide, rounded body with well-developed musculature. In this case the sacrum was flat, long and fleshy, muscled hams. As a result, the best score among the studied genotypes for the development of meat items was $55,8 \pm 0,10$ points in the offspring of the seed bull № 267-189867855.

Thus descendants of the bull № 267-189867855, which were characterized by the highest score for myasnost, exceeded the value of this indicator offspring from sires and № 341-189867854 № 60-189867858, respectively by 2.3 and 3.2 points, or 4.3 and 6.1%; ($t_d = 0,98$; $P < 0,95$ and $t_d = 1,37$; $P < 0,95$) and, in turn, superiority point for myasnost steers offspring of seed bull № 341-189867854 over their peers from seed bull number 60-189867858 was 0.9 points, or 1.7%; ($t_d = 0,40$; $P < 0,95$).

The difference in magnitude of the complex index evaluated different sires in line with previous estimates by their main characteristics, while respecting their ranking position. Thus, the integrated selection index all measured bulls were characterized by relatively high rates and the arithmetic mean value of this feature in different bulls was within 97,3-103,8 points. At the same time, a trend observed on average values of live weight at 8 and 15 months, average daily gain, feed conversion and meat quality steers progeny evaluated different manufacturers, preserved, but between-group differences in this slightly decreased in numbers. For example, the superiority complex selection index seed bull № 267-189867855 on indicators bulls and № 341-189867854 № 60-189867858 was respectively 4.7 and 6.5 points, or 4.74 and 6.68% ($t_d = 2,21$; $P > 0,95$ and $3,03$, $P > 0,997$). And, in turn, on the basis of the superiority of

Table 3 - Results of the tests on their own productivity steers

Characteristic	Indicator	Best (n=17 head)		Neutural (n=29 head)		Worse (n=14 head)	
		\bar{X}	C _v , %	\bar{X}	C _v , %	\bar{X}	C _v , %
Live weight 15 months.	kg	440,1	22,1	420,8	16,7	400,1	24,2
	index	103,9		100,0		97,0	
Average daily increase from 8 to 15 months.	g	996	12,6	919	13,5	847	12,0
	index	103,2		100,1		96,1	
Feed costs	unit	7,4	38,0	7,7	35,7	8,2	33,1
	index	103,0		100,3		96,1	
beefiness	point	55,5	14,0	53,3	13,8	52,4	13,3
	index	103,2		100,0		98,4	
Complex of indicotors	index	103,3		100,1		96,9	

the bull-producer № 341-189867854 on indicators seed bull № 60-189867858 was 1.8 points, or 1.85%; ($t_d = 0,85$; $P < 0,95$). As a result of all the work on the assessment of bulls-manufacturers on the quality of offspring and tests on their own productivity steers classes are each assessed bull-producers on a set of attributes that are listed in the same table (Table 2). Overall value of the complex seed bull № 267-189867855 index was - 103.8 points. That is, through the use of a common methodology for assessing the Kazakh white-headed breed bulls for progeny (for sons) found that a improvers category include bull № 267-189867855. The descendants of the seed bull № 341-189867854 differed comparatively lower body weight and growth rate. Weaker forms of development of the meat, as well as increased consumption of feed per 1 kg of growth have led to that full machining index had been 99.1 points, ie by 4.7 units lower than that of improvers. This gave grounds to classify it in the category of neutral. The descendants of the seed bull number 60-189867858 differed even less body weight and growth rate. The relatively weak development of forms of meat, as well as increased consumption of feed per 1 kg of growth have led to that full machining index he was equal to 97.3 points, ie 6.5 units less than the improver and 1.8 units less than that of the seed bull. This gave grounds to classify it in the category deteriorate. Exterior indicators obtained during the test steers like a seed bull № 267-189867855, and of bulls and № 341-189867854 № 60-189867858, can be considered optimal and it is appropriate for animals higher quality class. Data on the results of its own test steers productivity are also shown in Table 3.

We also found that there is a fairly high positive correlation between the estimated live weight of bulls sons aged 8 and 15 months. The correlation coefficient between these symptoms averaged 0.60. From the standpoint of early beef cattle productivity forecast is of great importance, as it gives the opportunity to predict the performance of calves own productivity since 8 months of age. The positive and high correlation between indicators of body weight of calves at 15 months. and the intensity of their growth from 8 to 15 months., body weight and severity of the forms of meat from animals of different genotypes ranged from $0,75 \pm 0,121$ to $0,85 \pm 0,123$. It was established that on record descendants seed bull № 267-189867855 differed lowest feed consumption per 1 kg of live weight gain, the descendants of the seed bull № 60-189867858 in all cases characterized by the worst feed conversion products, and peers from the seed bull № 341-189867854 studied on the grounds occupied an intermediate position. Suffice it to note that the flow rate of feed per 1 kg of weight gain during the period from 8 to 15 months descendants bull № 267-189867855 had the advantage on 0,3-0,70 feed. u (4,1-9,6%). When calculating the cost of weight gain a significant share of the cost falls on the content

of cow meat. Therefore, the cost of 1 quintal growth steers body weight in 15 months is significantly higher than the 8 months. Extension of the experimental cultivation of young growth can also lead to an increase in the cost of 1 quintal of weight gain, as the most significant cost item in the final period of fattening is the cost of feed. In this case the minimum unit cost in all cases characterized by the descendants of the bull № 267-189867855. Analysis of the data also shows that young bull from № 267-189867855 different higher realizable value and the profit obtained by the implementation of both the tribe and meat. Thus, the estimate of 3 sires for progeny and young test on their own productivity, carried out in conditions of farming farm "Bagration-2" showed that the implementation of their calves offspring for breeding (Table 4) at the age of 15 months net income per head 1 (bull progeny) was in the range 405 520 - 467 000 KZT. At the same time, the descendants of the seed bull № 267-189867855, recognized as the "improver" superior offspring peer seed bull № 60-189867858, recognized as "uhudshatel" to 61480 KZT (15.2%), and descendants of the seed bull № 341-189867854, recognized as a "neutral" - to 31390 KZT (7.7%).

Table 4 - Economic efficiency of growing up to 15 months of age and pedigree cattle relization

Indicator	Age, month	Indicators of progeny of different sires			
		Seed bull № 60-189867858	Seed bull. № 341-189867854	Sedd bull № 267-189867855	
The cost of feed for 1 kg of live weight gain, feed. u	8-15	8,0	7,6	7,3	
Bodyweight 1 bull, kg	15	400,4	420,7	440,0	
Realizable value of bull, KZT/ kg	15	1300	1300	1300	
Proceeds from the sale of bull, KZT	15	520520	546910	572000	
Cost of 1 bull, KZT	15	115000	110000	105000	
Net income KZT	15	405520	436910	467000	
Margin, %	15	352,6	397,2	444,8	
Comparative cost-effectiveness	KZT	15	-	31390	61480
	%	15	100	107,7	115,2

Table 5 - Cost-effectiveness of rearing in the growth of their body weight from 8 to 15 months

Indicator	Age, month	Indicators of progeny of different sires		
		Bull № 60-189867858	Bull № 341-189867854	Bull № 267-189867855
Bodyweight 1 bull, kg	8	223,2	226,6	231,1
Bodyweight 1 bull, kg	15	400,4	420,7	440,0
Increase in body weight in kg	8-15	168,2	194,1	208,9
The cost price of 1 kg of live weight gain, KZT	8-15	300	250	200
Cost of the total increase in body weight, KZT	8-15	50460	48525	41780
Realizable value of 1 kg of live weight gain, KZT	8-15	1300	1300	1300
Sales by the increase in body weight, KZT	8-15	218660	252330	271570
Net income KZT	8-15	168200	203805	229790

Margin,%		8-15	333	420	550
Comparative cost-effectiveness	KZT	8-15	-	35605	61590
	%	8-15	100	121,2	136,6

The level of profitability of rearing rated 3 bulls on progeny quality was very high: from the sale of calves for breeding (Table 4), it was 352,6-444,8% from the sale of young animals in the growth of live weight from 8 to 15 months (table 5) was 333-550% and the sale of meat calves (table 6) based clean meat calves output 15 months within 55%, it was 180-250%.

Table 6 – Cost effectiveness of the implementation of their rearing for meat in 15 months

Indicator	Age, month	Indicators of progeny of different sires		
		Bull № 60-189867858	Bull № 341-189867854	Bull № 267-189867855
Bodyweight 1 bull, kg	15	400,4	420,7	440,0
The yield of pure meat, kg	15	220,2	231,4	242
The cost price of 1 kg of meat, KZT	15	500	450	400
Cost of all meat, KZT	15	110100	104130	96800
Selling price of 1 kg of meat, KZT	15	1400	1400	1400
Proceeds from the sale of meat, KZT	15	308280	323960	338800
Net income KZT	15	198180	219830	242000
Margin,%	15	180	211	250
Comparative cost-effectiveness	KZT	-	-	21650
	%	15	100	110,9

The results of the present study is consistent with the theoretical and practical results of many of our research on the cross-breeding in animal husbandry [7-10].

CONCLUSION.

Thus, from the herd for breeding plant Kazakh white breed of cattle farm "Bagration-2» rated 3 bull-producer on the quality of the offspring and tested on their own productivity 60 head of calves. It was found that when evaluating sires, is virtually identical both in the exterior, constitution and by live weight, precocity and other visible of selected characteristics, conducted under the same economic conditions and their progeny also were characterized by similar figures for live weight at age periods 8 and 15 months, average daily gain and the cost of feed for 1 kg of live weight gain during this period and beefiness. However, although the between-group differences on the above features were not statistically significant, according to a comprehensive selection index difference between the performance of the bull "improvers" with figures of bulls "neutral" and "uhudshatel" were quite authentic. This once again confirms the correctness of the bull-producer assess the quality of the offspring by determining and comparing the integrated selection index, even at relatively equal rates by separate of selected features like themselves evaluated bulls and their progeny. From an economic point of view, the cultivation and sale of the Kazakh white-headed breed of young

breeding farm in a farm "Bagration-2" as a tribe, and the meat is a highly profitable business, which indicates a relatively high reference of the culture industry in this sector.

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