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## Research Article

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## Results of The Use of Deep-Frozen Sperm of Bulls-Producers in Meat Cattle Breeding Akmola Region Republic of Kazakhstan

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### Abstract

A lot of research has been accumulated on the creation of numerous animal populations of meat breeds based on the use of cryopreserved sperm of high-value bulls-producers of that livestock. Region Republic of Kazakhstan. Currently, 13 breeds and types of beef cattle are bred in the CIS countries, in which the Kazakh white-headed breeder occupies the largest share (66%). That's why the progress of the beef cattle breeding industry and the volume of production of high-quality beef depends entirely on its existence.

**Keywords:** Bull; Deep-frozen sperm; Meat cattle breeding

### Introduction

For more than 100 years' meat cattle breeding has been a traditional branch of animal husbandry in Kazakhstan. In today's conditions of the transition of economy to market relations, it requires the search for new progressive biotechnological methods and methods of reproduction of the herd and selection of meat animals that allow preserving and increasing the number of livestock, improving breed and economically useful qualities, and, based on this, to increase the production of high-quality beef and improve the profitability of the industry [1-4].

One of the methods of accelerating the genetic improvement of beef cattle is the use of deep-frozen sperm of bulls-producers, which will allow creating high-tech genotypes of large-sized type that can maintain a high growth of live weight for a long time, provide heavy carcasses with optimal fat content and have good indicators of reproductive ability and milkness [5-9]. Indispensable for breeding in extreme natural climatic conditions is the cattle of Kazakh white-headed breeds are distinguished by their endurance, unpretentiousness to fodder, high adaptive plasticity, good feed payment, increase in fattening and high meat precocity. There are big tasks in the field of intensification of agricultural production,

like new requirements that are imposed on the breed [3]. This is an increase of stature, the live weight of both young and adult animals, as well as an increase in the reproductive ability and milkness of cows. Therefore, their competitiveness will be facilitated by the creation of new factory lines and types of tall animals with the desired meat productivity and the optimum ratio of nutrients in their carcass.

### Materials and Methods

In order to increase the meat productivity of animals of Kazakh white-headed breed in Republican Center of livestock breeding JSC "ASYL TULIK" Akmola Region, Kazakhstan, an artificial insemination of cows with deep-frozen sperm of a bull-producer with desirable parameters of selection criteria for selection of Mars 3115 line Agromata 7392. To carry out custom matings with this sperm, a group of adult cows of higher bonitrating classes with a live weight of 550-560 kg was created in the amount of 100 g. from one motherwort. All animals were clinically healthy, had the same physiological state and were in the same conditions of feeding and maintenance. Insemination of cows was organized in accordance with the requirements of the recommendation on the organization of seasonal calves in the meat cattle and for the reproduction of the herd (1983) for two months.

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## Results

Analysis of the results of fertile animals with a herd from the first seed of various harvesting methods showed that cows inseminated with frozen semen from the desired bull had more pronounced fertility at 65%. From experimental animals there were received 35 bulls and 30 calves. According to the live weight, bulls-producers of the desired type at the age of 2, 3, 4, 5 years and older exceed the requirements of the higher class by 100-170 kg, or by 15-19%. Characterized by new genotypes, tallness is combined with massiveness, which determines their good meatiness. So, the full-fat producers have a height at the withers of 141 cm, the width of the chest - 68, the girth of the chest-245, the cows-124; 50.0; 196.8 cm respectively. The estimation of breeding bulls according to the growth rate by the method of control growing at the testing station revealed an improvement in these qualities, especially in the herbivores animals. So, the sons of the King 13682 (Balhash), estimated by their own productivity, from 8 to 15 months. showed an average daily increase of 1175 g (1075 - 1262 g) and the excess by 33.2% of the best indicator of the valuation of sons of unrelated bulls-producers of other lines. Bull Mirage 5085k is recognized as an improver with a breeding index "B"-103.5%.

The meat productivity of animals of the new factory line can be judged most fully by the results of control slaughter of bull-calves at the age of 16 months. Intensive cultivation makes it possible to obtain heavy enough carcasses from them (245 - 251 kg) with an insignificant accumulation of internal fat (11 - 13 kg). Carcass of linear bull-calves contained 80.7% of flesh and 16.88% of bones, i.e. for 1 kg of bones was 4.8 kg of pulp. The average sample of ground meat contained 12.1% fat and 19.64% protein, the calorific value was 7.9 MJ. The protein-quality index was 7.07 [5].

The herd of pedigree cows created by the method of thoroughbred breeding along the lines in the dry steppes of the Akmola region, becomes an integral biological system with its own development. The system-forming factor is the interrelation between the heredity of animals and the environment. The internal factors linking the herd to a single system are genetically homogeneous populations, i.e. genotypes.

## Discussion

Linear cows were inseminated with sperm of bulls of similar genotypes, and analysis of the change in the live weight of offspring in different age periods allowed to judge the most optimal variants of parents' compatibility.

From the bulls of the factory line King 13682 (Balhash) at crosses with other lines of the herd there were relatively large calves. The live weight of the newborn bulls was  $29.5 \pm 1.32$  kg, which exceeded the average weight in the herd by 2.5 kg (9.0%). By the weight of the calf at the age of 3 months the most successful combinations were obtained as a result of the pairings of the manufacturers of the factory lines of the Castle 3035, the Buckle 5545k, the King 13682 (Balhash) with the daughters of the factory

type Agromata 7392. The live weight of the bulls was  $101.2 \pm 0.87$  kg.

More adaptable to the influence of environmental factors in the post-withdrawal period were the animals from the linear bulls-producers Smychka, Cherrill 60 (Champion) and King 13682 (Balhash). Thus, the live weight of these animals at the age of 12 months was 3.5 to 13.9 kg that is higher than the requirements of the elite-record class. In general, the average for all gobies was 354.3 kg, which exceeded the requirements of the elite-record class by 4.3 kg. The most effective combination by weight is steers at the age of 15 months. Cows of the lines of King 13682 (Balhash) and Maple 70272 (Bereke). The living mass of their offspring exceeded the requirements of the breed standard by 113.1-115.5 kg (31.0- 32.0%) and elite class-by 53.1-55.5 kg (12.0 - 13.0 %). To determine the relative longitude of offspring, studies on the growth of live weight of various genotypes continued until 18 months of age. As a result, it was found that the bulls, obtained from the bulls of the factory type "Agromata 7392" and linear cows, were distinguished by an increased live weight in comparison with their peers. Their average live weight for all types of cross-section of linear animals was  $530.6 \pm 2.63$  kg, which was higher than the requirements of the breed standard by 28.0% and elite-record class-by 10.0%. Thus, there is a trend of the most optimal variants of compatibility of parents' genotypes. Analyzing the size of the live weight of gobies and calves in different age and periods of cultivation, it can be concluded that in order to obtain relatively long-lived animals, the pairings of Ancatian producers with cows of local breeding, as well as cows of the King 13682 (Balhash) factory line with the bulls of other lines, are the most successful.

The purebreeding of Kazakh white-headed cattle, that is based on inter-linear crosses, sometimes on the basis of intralinear selection, taking into account the most successful combinations and selection of genotypes with the desired productivity parameters by the method of two-stage evaluation of bulls-producers and effective use of bulls-enhancers, made it possible to create a highly productive herd with six factory lines, including the planned factory line of King 13682 (Balhash).

According to the (Table 1), it can be seen that the high productivity of animals shows a good compatibility of bulls-producers of the new line with the rest of the structural elements of the herd, which significantly exceed the breed standard by 105 - 114%. According to the data of bonitation, animals are characterized by high living weight. The cows of this line have an average live weight of 551.8 kg, which exceeds the requirements of the breed standard by 31.8 kg, milk yield by 26.1 kg and MOS at 38.5 days shorter.

According to the estimation of the ex-terrier and the constitution, cows exceed the standard by birth: at the age of the first calving - by 8.2 points, the second calving - by 8.9 points and the third calving - by 3.5 points, or by 10.2; 11.5 and 4.7% respectively.

Linear belonging mother of cows	n	Sign of selection												Quantity cows of the elite class-record and elite
		Living weight cows, kg		Cv, %	Milk content, kg		Cv, %	Assessment of exterior, score		Cv, %	Reproductive ability (MOS), day		Cv, %	
		X	±Sx		X	±Sx		X	±Sx		X	±Sx		
Kyran	25	545.8	11.73	6.8	208.7	6.78	10	78.1	1.23	3.1	378	23.47	15.8	18
Bakan	18	556.7	9.94	5.7	215.4	5.98	8.6	79.8	0.98	8.7	400.9	19.67	19.7	13
Cherchill 60 (Champion)	63	552.6	10.17	5.8	212.3	7.32	10.8	78.7	1.06	4.0	428.3	25.15	21.8	44
Samuruk	14	555.8	12.02	6.9	203.2	6.03	10.16	78.3	0.87	4.5	400	20.81	18.3	10
Maple 70272 (Bereke)	120	549.8	15.31	8.5	2099	6.99	10	81	1.27	4.7	373.9	17.83	17.97	84
Brest	10	539.9	11.80	6.6	207.2		14.4	79.3	1.87	6.8	400.1	19.16	15.77	7
Baikal	250	551.8	9.07	5.2	211.1	4.38	3.1	78.5	1.86	5.2	392.5	21.13	10.8	175
Orman	1502	528.0	10.90	6.3	207.7	7.33	4.8	79.3	1.24	4.7	429	20.14	17.87	1133
King 13682 (Balhash)		106.1			114			105			90.7			
Ornbor	16.6	104.5			109.3			98.4			90.7			15.5

**Table 1:** Indicators of economically useful signs of adult cows at cross-breeds of producers of the King 13682 (Balhash) factory line.

A characteristic feature for the animals of the King 13682 (Balhash) line is the long stature and high live weight in the adult state. They reach the highest living weight at the age of 8 years. The average height of the cows in the sacrum is 128 - 129 cm. The King 13682 (Balhash) line in Republican Center of livestock breeding JSC "ASYL TULIK" Akmola Region, Kazakhstan occupies the first place in the number of herds. It was tested: linear animals-only 432 heads, of them bulls-producers -2 heads, cows -250 heads, heifers of lateral age-180; Kazakh white-headed cattle only 2513 heads, in which cows -1502 and bulls -13. The whole herd is represented by purebred animals, of which the elite record is 779, elite-980 and class I-754 heads. 901 cows were allocated to the breeding core, 510 of them were allocated to the breeding group. Three bulls were evaluated for the quality of offspring and 160 bull calves and 230 calves for their own productivity. Live weight of bull-calves in 15 months varied from 415 to 500 kg with an average daily gain of 820-1245 g, an estimate of the meat form of the body-53.9-58.5 points, for the calf the living weight was 310-350 kg at this age

## Conclusion

Crossing the manufacturers of the new factory line allowed to increase the productivity of animals in comparison with the breed standard by 5-14% and to improve the meat forms of cattle of Kazakh white-headed breed. The principle of distinguishing lines of different factory dignity and purpose, in our opinion, it is a great practical importance for organizing the method of artificial insemination of animals and breeding work. Further improvement

of the herd of Kazakh white-headed breeds should be carried out by the method of purebred breeding along the lines in the direction of increasing the live weight, long stature and high growth of animals, increasing the growth of energy of young animals on the basis of using bulls-producers, estimated by the quality of offspring with breeding index "B" more than 101.0%, that is providing average growth of live weight 1100 - 1300 g to the offspring. Considering the high adaptability of Kazakh white-headed cattle to dry-steppe and semi desert conditions in the south-east of the country, they should be widely used in cleanliness and industrial crossing with dairy breeds in farms with significant reserves of coarse and succulent fodder.

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