INVESTIGATION OF REPRODUCTION AND SELECTION POTENTIAL OF HOLSTEIN BREEDING CATTLE IN KYRGYZSTAN

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In this article, statistical results of selection characteristics and milk yields, live weight and reproduction characteristics of Holstein sheep breeds grown in Kyrgyzstan conditions are given according to their origins and ages. Parameters were calculated for milk yield and growth characteristics. For this purpose milk productivity, lactation and live weights of cattle were measured. Holstein cows were crossed with local races to improve productivity during milk productivity and lactation. As a result, there are significant variations in some yields in the animals raised. According to the results obtained, the live weights of Holstein cows raised in Kyrgyzstan were 505.4 kg, the first lactation milk yield was 4641.9 kg, the second lactation was 5082.4 kg and the third lactation was 5127.1 kg. In the same order, service period lengths were obtained as 119.2, 101.5 and 96.4 days. The coefficient of variation for the lactation yields was calculated as 6.04% for live weights and 13.13, 14.78 and 17.47 for lactation milk yield, respectively. This coefficient was 38.82%, 40.10% and 54.41% in terms of reproductive characteristics, respectively. It can be understood from these figures that it is understood that there is possibility to make progress by making selection in this herd. The results are presented in tabular form. Since Kyrgyzstan is a mountainous country, native animal breeds have also been adapted to these conditions. Local animal breeds have also been selected and raised by native scientists. Local races are grazed in the mountains and for this reason they have become adherent to harsh weather conditions. As a result of this article, it was determined that there is a significant variation in terms of breeding and milk yield characteristics and this is the result that can be evaluated in Holstein breeding in Kyrgyzstan.

Keywords: Holstein Race, Herd Parameters, Breeding Characteristics, Milk Yield

Animal husbandry of Kyrgyzstan has a leading meaning in the agriculture sector. Because it constitutes more than half of the income earned. One of the main ways to increase the efficiency of dairy cattle breeding is targeted at the improvement of existing and creation of new, more productive and efficient livestock. Taking into consideration that at the present time, the world's Holsteins breeds appreciate and characterize not only as the most milk productive, but also as the most technically advanced that is like no other breed meets requirement to widespread use of mechanization and automation of milking cows, as well as taking into account the extremely high rate of Holstein cattle population growth and productivity in many countries around the world including in Kyrgyzstan. It was initiated purposeful crossbreeding of local breeds of cattle with Holstein bulls to develop new more productive genotypes of black and white cattle. Since 1981 on the farm of Open-Joint Stock Company "MIS" made breed improvement best dairy breeds in the world: Holstein-Friesian Black Pied, Holstein-Friesian Red-and-White, Anglo-Frisian, Dutch, Swiss American selection, Ayrshire, on the identification of adaptation to local climatic conditions and obtaining the highest milk production [1]. Also imported pure-bred cattle from the Kaliningrad region, Germany and Lithuania. Thus, it conducted thoroughbred breeding Holstein-Friesian and absorbing cross Alataoo cows in Kyrgyzstan. At the moment genealogy herd structure is the world lines of Holstein bulls, widespread in all climatic zones of the world. The most important breed in breeding milk is the breeding line of Holstein cattle [1]. These many breeders suggest a favorable influence on important Holstein breeding traits as the value of milking cows and suitability to machine milking [2–5]. Implementation of genetic potential to the productivity of cattle imported from foreign selection is possible, provided that the same or better conditions, as well as improved housing and feeding technology will be created for these animals [6, 7]. Therefore the aim of this study was the analysis of the main indicators of selected features productivity Holsteins bred in Kant of MIS based on age and origin.

Materials and methods of research

The objects of research were the cows of Holstein breed, bred in different lines of breeding farm in Kant. Experimental animals throughout the experiment were clinically healthy, were in the same conditions and fed. Milk productivity evaluated by milking during 305 days of lactation or whole shortened lactation [3]. Also assessed the quality indicators of animal milk. As an indicator of the reproductive capacity of the service period studied by analyzing accounting data animal pedigree certificates. In determining the selection and genetic parameters of selected attributes calculated: arithmetic mean (X) and its error (mx), variability, expressed as a standard deviation (σ) and coefficient of variation (CV). By the mathematical processing of experimental data and analysis of breeding and genetic parameters used conventional methods of variation statistics[4].

Results of research and their discussion

Productivity – the main economic feature of farm animals, and therefore it is the basis of all methods of selection on complex traits [6]. The animals were taken in terms of productivity, taking into account the variability of quantitative and qualitative indicators. The level of milk productivity is not only dependent from the breed, but also from individual animal within a breed. In any herd cows are more or less productive, and this diversity is the best selection for positive animals [7].We studied milk productivity in 63 cattle on the farm and the basic statistical parameters. The level of milk production at the cow of Holstein breed at the MIS farm varies greatly. The simplest measure of variability of this trait – a limit value that is the absolute different between the maximum and minimum values of the trait (min-max)). In this case, the animals examined levels of milk production limit is: 1. lactation 3395 (6405–3010) kg, 2. lactation 4940 (7310–2370) kg, 3.lactation 3117 (4869-7986) kg. It speaks of a very wide range of variability of this trait [8]. For a more complete study of the degree of expression and the variability of use were calculated and other statistical parameters of averages and variability. The data obtained are demonstrated in Table 1.

Table 1

Average live weight and milk yield, standard deviation and coefficient of variation of Holstein cows (n = 66)

Main breeding features	Statistical parameters		
	X + mh, kg	σ, kg	Cv, %
Live weight, kg	505,36 ± 3,76	30,55	6,04
Milk production for first lactation, kg	4641,89 ± 75,01	609,37	13,13
Milk production for second lactation, kg	5082,39 ± 92,47	751,20	14,78
Milk production for the third lactation, kg	5127,05 ± 111,11	895,83	17,47

Table 2

Milk and fat yields of daughters in first lactation according to Breeder's Bull

Name of the bulls	Place of the birth of bull producer	Number of daughters	Productivity of daughters		Live weight	Productivity of mothers	
			Milk	Fat		Milk	Fat
Durman 361	Russia	1	4194	3,94	465	4156	4,01
Estamp 776	Russia	36	4274	3,96	485	4172	3,86
Bellfast 5032	Switzerland	19	4289	3,96	480	4339	3,92
Marvud 2293604	USA	20	4352	3,97	500	4119	3,92
Santal101	Canada	6	4628	4,04	485	4189	3,89
Lido23677	FRG	7	3903	3,04	475	4007	3,83
Caffe3481	Israel	14	4292	3,97	475	4412	3,92
Herzog 119	Canada	5	4450	3,87	454	4534	3,81
Atlas 7032	Switzerland	20	4612	3,95	475	4359	3,93
Craft 66270	Canada	10	4757	3,91	495	3858	3,95
Europio 92012	Italy	23	4588	3,91	495	3858	3,95
Insbruk 5539	Canada	10	5180	3,94	495	4341	3,85
Lin 482495	England	6	4301	3,9	485	4416	3,95
Persuader 13064124	FRG	5	4973	3,91	500	5358	3,81
Patsil 3421	Israel	14	4161	3,91	485	4350	3,92
Choice 30634	USA	1	3717	4,1	495	4843	4,09
Shammi 1029	Italy	1	4143	3,83	500	5074	3,78
Avsha3651	Israel	21	4810	3,9	475	3997	3,83
Total		251	4411	3,95	484	4195	3,77

According to the data from Table 1 shown that the average yield on the study group (n = 66) Holstein cows on the first lactation is 4641, 89 ± 75, 01 kg and there is a gradual increase in the 3-and lactation is 5127,04 ± 111,11 kg and the difference in milk production between 1st and 3rd lactation was 486 kg. Also, an increase in the coefficient of variation, cow on the 3rd lactation has a very high level of variability of this trait – coefficient of variation 17.47 % [19]. Shown productivity from bull producers and amount of milk with fat content. The origin of the bull producers which is very important for consideration in Table 2.

The main factor affecting milk production is forage quality. In recent years there has been a downward trend because of the non-harvesting time, violations of the harvesting technique and storage technologies [9]. The result of this economic activity becomes lower total nutritional and palatability of feed animals, a chronic lack of protein and energy in the diet and a sustained reduction of the synthesis of milk cows in the body [8]. Also currently farming experts pay great attention to the study of reproductive function in cattle, since violations abnormalities cause great economic damage to farmers [10]. In connection with the introduction of artificial insemination to animals become important Bulls score on fertility [9]. The important role played by hereditary reproductive function of cows, their fertility. The reproductive capacity of animals affected by external factors (feeding, housing system, season of the year, and lighting) At the same time it is largely due to heredity [11]. Sexual maturity occurs in heifers at 18 months. Reproductive function greatly depends on the state of the endocrine system, which is genetically determined. The synthesis of hormones that affect the formation and development of the reproductive function is due to genetically at the molecular level [12]. One of the indicators of reproductive ability in the cattle is a service period – the time interval from calving to productive mating. According to many researchers and an optimal duration of the service period is considered to be 60–90 days [12]. In order to study and determine the statistics service period of our sample is composed of 66 pedigree breeds Holstein at MIS farm. Average indices and indicators of variability service period of cows of Holstein breeding in MIS farm are demonstrated in Table 3.

Analysis of the data table shows that the duration of the service period of the studied animals is very variable. In many cases, the duration of the service period exceeding 100 days. There are also animals with the duration of the service period of over 200 days. In rare cases, the animals found with a service period of at least 40 days [13]. The reason for the duration of the service period, in this case, apparently, due to the low fertility of cows, as well as the duration of the lactation period, i.e. in this case, the cows do not start on time [14].

Analyzing the average duration and variability in service time Holstein breed cows shown it can be noted that there is a tendency to reduce the duration of the service period of the sequence with increase of calving. So the animals after 3 calving had an average duration of the service period of 96.4 days, which is closer to the optimal index. The highest duration of the service period, discovered in animals after 1.calving (119.21 days) [16, 17]. It should be noted that the variation of the trait (the coefficient of variation CV) in the studied animals are very high and amounts to 38.82, 40.1 and 54.31 %, depending on the order of calving [18, 19]. Maintenance and breeding of animals with a high duration of the service period is not economically feasible, as in this case increases the cost for the maintenance and care of animals and the diminishing returns of products [19, 20].

As it's known, the value of milking cows depend on the conditions of feeding and maintenance, by heredity, level of exploitation of animals and the level of breeding work on the farm. To increase milk production and a fuller realization of the genetic potential of Holstein animals need to improve the content and provide a stable balanced feeding, and also to introduce a modern method for assessing the breeding value of the animals and the import of animals and sperms of better quality [21, 22].

Table 3

The average values and variability of the length of service period in Holstein cows (n = 66)

Priority service period	Statistics days		
	X ± mh,	σ, days	CV, %
Service period after 1st calving	119,21 ± 5,70	46,28	38,82
Service period after 2nd calving	101,48 ± 5,01	40,69	40,10
Service period after 3rd calving	96,4 ± 6,76	52,35	54,31

As a result of this article, it was determined that there is a significant variation in terms of breeding and milk yield characteristics and this is the result that can be evaluated in Holstein breeding in Kyrgyzstan. Significant variations were obtained when appropriate bull sperms were selected according to average milk yield, live weight and reproduction parameters. When they are selected according to their selection criteria and evaluated according to 2 or 3 frosting yields, it is concluded that Kyrgyzstan can be used as an important selection criterion in dairy cattle breeding.

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