



## FORMATION OF FARM USEFUL INDEXES OF GENERATION FOR AN INCREASE OF BREEDING INDEX OF GENOTYPE OF BLACK MOTLEY BULLS OF HOLSTEIN BREED

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### ABSTRACT

The article depicts genotype evaluation and selection of black motley bull-improvers of Holstein breed imported from Germany to "Uznaschilik" state enterprise. According to obtained and analyzed main parameters of bull-improvers, a total merit index of bull genotype (RZG) and official index for production (RZM), conformation traits (RZE), somatic cell score (RZS), fertility (RZN) and farm use (RZR) indexes were estimated and analyzed. These indexes were estimated and selected individually per bull. Estimation and selection procedures on imported bull-improvers are being implemented together with republic breeding farms on breeding herds. These imported productive bulls are obtained from individual ordered selection and pairing of the parental ancestors estimated by generation quality.

**KEYWORDS:** black motley Holstein, leading, improver, herd, genotype, potential of genetic productivity, total merit index, dairy and meat products, farm useful traits, artificial insemination.

### 1. INTRODUCTION

It is true to say that the accelerated period of development of animal husbandry in Uzbekistan has begun. An example of this is the establishment of the Committee of Veterinary and Livestock Development.

Under the rational leadership of our president Shavkat Mirmonovich Mirziyoyev, a rapid development of peaceful lifestyle of people and public economy is substantiating its perspectives. In 2019 March 28, a decree # 4254 "About the organization of the activity of State Committee of Veterinary and Livestock development of the Republic of Uzbekistan" was adopted in which all measures on the factors of its development have been fixed. In this regard, the establishment of "Uzbekchorvanal" agency and the formation of related systems will lead to effective improvement of breeding work and wide range implementation of selection methods in the republic.<sup>[1,2]</sup>

It is known that cattle breeding is one of the main branches of animal husbandry and it provides food

security of the population with dairy and meat products.

Therefore, as the breeding work of cattle improves, the breed of the strains improves and the productivity increases. One of the most important factors in large-scale selection methods is the wide use of pedigree bull sperm and the further introduction of artificial insemination. It is the most effective and cost-effective method of genetic improvement of herds. With the gain of a large number of productive generations from well-known pedigree bulls, the herds improve and the selection efficiency increases rapidly.

Among the cattle breeds regionized in different regions of the country, the majority of cattle are black motley breeds and black motley Holstein improving breeds. First of all, some more important factors are the improvement of the black motley breed, formation of its productive herds and the establishment of breeding plants for the black motley Holstein breed, and the use of the genetic potential of pedigree bulls.<sup>[8,9]</sup>

To achieve the maximum overall genetic gain in dairy cattle breeding, a Total Merit Index is applied to improve all traits according to their relative importance in the breeding goal. This Total Merit Index is called RZG (Relativ Zuchtwert Gesamt) and is applied to Holstein and Red Holstein. Relative weights for included traits were last revised in August 2008 to put more emphasis on functionality and health traits. The derivation of the Total Merit Index (RZG) is based on selection index theory. This is providing the optimum overall selection response in all traits. The RZG is only published if a bull has an official index for production (RZM), somatic cell score (RZS) and conformation traits (RZE). The RZG is standardized to a mean of 100 in the base (cow base with all cows who are 4-6 years old, born 2011-2013) and a genetic standard deviation of 12 points. The official ranking of German top bulls is by RZG. Breeding values of Holsteins and Red Holsteins in Germany are estimated three times a year.<sup>[7,11]</sup>

It is known that black motley Holstein cattle rank first among the world's dairy breeds in terms of their genetic productivity potential. Their milk yield has increased from an average of 10 000 kilograms to 12 000 kilograms in different countries, with record-breaking cows producing 30 000 to 40 000 kilograms of milk per lactation. Demand for this breed and its pedigree bulls is growing. In Uzbekistan also it has great prospects. The breeding index of improver bulls is also rising. This can be seen in the example of bulls imported from Germany. When importing bulls, we used methods to determine the breeding index of their genotype, as well as the quality of the formation of farm useful indexes in the resulting generations. 17 imported bulls were transferred to the groups of improver bulls and leading improver bulls and analyzed by their breeding qualities.

## 2. MATERIALS AND METHODS

We used modern selection methods, focusing on the estimation and selection of black motley bulls of Holstein breed imported from foreign countries by their genotype. The experiments were conducted at the state enterprise "Uznaslchilik" in Kibray district of Tashkent region in 2018-2020.

A total merit index of bull genotype (RZG) and official index for production (RZM), conformation traits (RZE), somatic cell score (RZS), fertility (RZN) and farm use (RZR) indexes were estimated based on the analysis of each bull's passport.

## 3. RESULTS AND DISCUSSION

Evaluation and selection of bulls by the above methods are used for the first time in the Republican breeding practice. As can be seen from the data in the table, the imported pedigree bulls were obtained from individual

customized selection and pairing of the parental ancestors estimated by generation quality.

The sires of all bulls showed high genetic breeding and productivity qualities at the estimation by generation quality. In particular, in these experimental groups, their total merit index constituted average 130,6 and 144,5 respectively. The indices in their individual indicators fluctuated between 116-150. In these breeding indexes, the farm useful indices of the generation of bull sires are formed at different levels, that is, genetic breeding heredity affected differently. Particularly, milk yield index of sire generation in the group of bull improvers rose to 122.7, official index for production to 120.3, somatic cell score to 107.1, fertility index to 111.6 and farm use time index increased to 105.1 respectively to breed structure, while in the group of leading improver bulls, these parameters were noted much higher – to 132.7, 127.2, 113.7, 123.1 and 107.6 in percentage respectively. The systemic form of the milk yield conformation index of generations from high-genetic breeding and fertile ancestors has been rapidly improving and increasing. No significant increase was observed in other quality indexes, and especially in the fertility traits.

**Table Formation of generations farm useful indexes in the increase of total merit index of breeding black motley Holstein bull-improvers.**

№	Breeding bulls		Total merit index of (sire) genotype (RZG)	Formation of farm useful indexes of sire generation				
	Name	Number		Official index for production (RZM)	Conformation traits index (RZE)	Somatic cell score (RZS)	Fertility index (RZN)	Farm use index (RZR)
<b>Bull improvers</b>								
1	Unit	236951	116	96	118	100	131	116
2	Urmaz	657342	122	118	108	106	114	99
3	Uralu	633203	133	134	108	97	113	95
4	Ursinus	395673	135	138	112	112	83	110
5	Uraliy	633110	136	124	133	118	117	102
6	Uros	657347	136	124	133	118	117	102
7	Ursola	195697	136	125	130	99	118	112
<b>Mean:</b>			<b>130.6</b>	<b>122.7</b>	<b>120.3</b>	<b>107.1</b>	<b>111.6</b>	<b>105.1</b>
<b>Leading bull improvers</b>								
1	Urim	657334	137	118	133	117	127	112
2	Urika	657333	137	118	133	117	127	112
3	Uriel	657319	147	137	126	116	120	103
4	Urlas	657341	147	137	126	116	120	109
5	Ursa	657353	147	137	126	116	120	103
6	Ursine	322327	139	131	108	105	121	115
7	Ursel	657372	146	137	129	104	121	106
8	Uris	657335	146	137	129	104	121	106
9	Uralo	633141	149	134	125	111	127	118
10	Ulfilas	657309	150	135	137	131	127	92
<b>Mean:</b>			<b>144.5</b>	<b>132.7</b>	<b>127.2</b>	<b>113.7</b>	<b>123.1</b>	<b>107.6</b>

The data obtained indicate that black motley Holstein bulls that are selected and imported have genetic breeding and productivity potential at the level of use. Using them widely in artificial insemination ensures high selection efficiency.

Extensive use of artificial insemination of bulls evaluated by genotype (origin and quality of generation) is yielding positive results in developed countries with improved selection methods.<sup>[9]</sup>

The application of these methods into breeding practices in the republic is under the solution. They are intended to develop cattle breeding rapidly.

In the herds of local, black motley breed genotypes at private assisting, peasant and commercial farms, individual and group selection methods should be used in artificial insemination of cows, heifers of pairing age with the sperms of black motley Holstein breed bull-improvers, while Holstein genotype black motley and Holstein breed cows and heifers at breeding farms are to be inseminated artificially with the sperm of leading bull-improvers. At present, on the farms in the country an average of 1775 kilograms of milk is produced, while the milk yield of cows in the public herds will increase to

3000-4000 kilograms, and in breeding farms - 5000-6000 kilograms. Selection and economic efficiency are achieved on farms.

#### 4. CONCLUSIONS

Introduction of advanced practices of the countries with improved selection methods.

Extensive use of genetic breeding traits (black-motley Holstein) of the world improver breeds.

Extensive use of improver bulls' breeds obtained individual selection and mating methods of paternal and maternal ancestors.

Improving the crossing of public and farm livestock with bull-improvers.

Extensive use of artificial insemination with the sperm of black motley leader bull-improvers of Holstein breed for the improvement of breeding base of Holstein genotype black motley breeds at the herds of cattle farms.

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