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A Highly Productive Herd Of Holsteinized Black-Pied Cattle.

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ABSTRACT

The influence of blood on Holstein breed and linear accessory on milk productivity, reproductive qualities and exterior of cows of Black-Pied breed is studied. It was found that the increase in the proportion of blood on Holstein from 7/8 to 15/16 has a positive effect on milk production. The most perspective for increase of productivity and the subsequent breeding work is the line of a bull Reflection Sovereign 198998.

Keywords: holsteinized black-and-white breed, line accessory, milk productivity, reproductive qualities.

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INTRODUCTION

Within the framework of the State Program of Agricultural Development for 2013-2020, it is planned to increase significantly the production of agricultural products. At the same time, special emphasis is placed on increasing livestock production and, in particular, dairy cattle breeding, as the main and dynamically developing direction. The industry is in difficult economic conditions and, focusing on the implementation of its tasks of effective import substitution, strives to function using breeding techniques based on modern achievements of science and practice.

The dominance of imported goods, the apparent disparity of prices for domestic agricultural products, the lack of fair competition in sales pose a real threat to Russia's economic self-sufficiency. According to experts, the fruit and vegetable industry, and among the areas of livestock – dairy and beef cattle were the most dependent industries. Every year the country imported about 30 % of milk powder, 27 % of cheese and 30% of butter [10].

However, the food embargo imposed in August 2014 against the states that exerted sanctions pressure largely resolved these issues and created unprecedented conditions for the development of the domestic agroindustrial complex. Farmers were in a favorable position, because, on the one hand, suppliers of cheap milk, cheese, beef, pork from Ukraine, Poland, Germany, Australia, the United States (11-20) were eliminated, and on the other, in the framework of the priority project of deinternationalization of Russia the volume and direction of subsidies to agricultural enterprises of various forms of ownership were significantly expanded.

The resulting “window of opportunity” should be used as efficiently as possible and in a relatively short period of time (the duration of the ban on the import of food products is only one year). In such a short period of time it is impossible to change radically the structure of the agricultural economy, the technology of its management, the system of financing, etc., but to lay the foundations of reforms that will later bear fruit and revive the village, it is quite real.

World experience shows that one of the main ways of modernization of dairy cattle breeding is the intensification of the use of genetic resources of the industry [11-20]. Domestic dairy specialized breeds of cattle, due to long-term purposeful breeding work, use of the best world gene pool and advanced achievements of selection and genetics, today do not concede to foreign analogs on productive qualities, and on adaptation ability, strength of the constitution and suitability for operation in the conditions of industrial technology – even surpass [1-9].

Thus, breeders face the challenge of establishing the most desirable genotype (the proportion of blood by Holstein), which will provide a high milk productivity of animals, improve the qualitative composition of the milk and leads to a reduction in productive longevity of cows.

On the territory of the Russian Federation for more than 30 years there is the process of breed transformation of dairy herds on the basis of crossing the breeding stock of Black-Pied cattle with Holstein breed bulls. Thus, in the Central Blackearth zone the number of animals of Black-Pied breed and its hybrids with different proportion of blood is more than 43.5% of the total population. As a result, the question of the impact of Holstein process on the economic and biological characteristics of Black-Pied cattle needs to be clarified.

In breeding work, one of the most effective methods of improving the already established stable breeds is considered to be breeding along the lines. This selection technique largely determines the economy of milk production, provides quantitative and qualitative growth of the herd. In this regard, it is important to establish the most promising and valuable lines in the breeding relation, the use of which will determine the further increase in productivity and development of the Black-Pied breed. This led to the scientific search and selection of research areas presented in this paper.

Purpose and objectives

The purpose of the present research was a comparative evaluation and comprehensive analysis of economic and biological characteristics and selection and genetic parameters of Black-Pied cows of different breeds and linear affiliation.

To achieve this goal, the following objectives were set:

- to analyze the conditions of feeding and keeping animals to determine the possibility of realizing their genetic potential;
- to study live weight and exterior of experimental cows;
- to compare the morphological and functional properties of the udder of the studied livestock;
- to establish the features of the formation of milk production of animals;
- to study the reproductive qualities of animals;
- to assess the economic efficiency of breeding Black-Pied cows of different breeds and linear affiliation.

METHODS AND MATERIALS

In the FSUE “Belgorodskoe” of the Russian Agricultural Academy in Belgorod region, which is the breeding farm for the breeding of Black-Pied breed, concentrated highly productive herd, which can become a platform for genetic progress in the entire region. The average milk yield per feed cow is 7944 kg, 33 % of the total livestock has productivity at the level of 8000-10000 kg of milk per lactation, and 3 % - more than 10,000 kg. The farm has been working for a long time to increase fat content and protein content, which is reflected in the indicators of 3.86 and 3.38%, respectively.

Despite significant progress in increasing milk production, the animals maintained good reproductive qualities: the output of calves for several years in a row does not fall below the level of 97 heads, the duration of the main economic periods (service period, dry, intercalving) satisfy zootechnical standards.

It is important to note that the duration of production use of cows ranges from 3.31 – 3.51 calving. Over 30 % of the animals in the main herd are aged 4 or more calving. Thus, the repair of the herd is fully compensated at the expense of own livestock of cattle, and the cost of reproduction covered by the profits from milk sales.

Analysis of the genetic structure of the herd has allowed establishing that the studied animals are the descendants of the Black-Pied cows and Holstein (BPH) bulls (partly foreign breeding) of III and IV generations. Linear composition is extremely varied, but most of them are the representatives of the genealogical groups M. Chieftain, W.B. Ideal and R. Sovereign bulls.

To identify the most promising genotype under the conditions of intensive technology studies on the basis of breeding plant in the period 2015 – 2016 on the integrated assessment of economic and biological characteristics of mature holsteinized Black-Pied cows and economic efficiency of their breeding were organized. During the experiments, the following indicators were studied: live weight and exterior, including details – morpho-functional properties of the udder, especially milk production of animals and their reproductive quality, as well as the economic efficiency of milk production by representatives of different genotypes.

To achieve these goals and objectives two groups of cows of 30 heads in each were formed, taking into account the breed, age, calving period. Within groups distribution depending on linear accessories of animals was also conducted (M. Chieftain, W.B. Ideal and R. Sovereign).

Cows were grown according to the technology adopted in the economy, and they were not isolated from the total population during the experiment. Feeding was carried out according to the technology established in FSUE “Belgorodskoe” and completely corresponded to the modern detailed standards taking into account live weight, level of a milk yield and a physiological condition of animals.

The basis of forage base was forage of own production (hay, silage, root crops, grass of annual and perennial legumes). The nutritional value of the used feed products was evaluated on the basis of laboratory tests, at least twice a year. To balance the diet in terms of sugar content and normalization of the sugar-protein ratio, beet molasses was additionally introduced into the feed at the rate of 1.5 kg per head. Microelements were introduced in the composition of vitamin and mineral fertilizing in quantities corresponding to the physiological needs of animals. Drinking is made from car water dispensers from specially drilled artesian wells. Barn equipped with group feeders, the feeding per head is 0.8 m. In winter, the animals feed is specified in the form of mixtures prepared in the mixer of the brand KTU-10 "MASTER".

In the plant, we constantly monitor the usefulness and the balance of animal feed by clinical inspection of the herd, and laboratory studies on the total protein, ketone bodies, calcium, phosphorus, carotene and reserve alkalinity of the blood. At the enterprise, regardless of the season, the feeding of the experimental livestock was high enough, balanced and corresponded to the detailed norms of feeding of agricultural animals.

The maintenance of cows at the enterprise in the winter (from October to May) is stall-tied, with the organization of active exercise on the paddock. Milking cows is carried out three times a day in specially equipped milking parlors. The farm uses milking machines with milk pipeline UDM-200 with the receipt of milk in the tank-cooler brand DF 953 Wedholms, which significantly improves the sanitary quality of produced milk. In the summer, the animals were kept in camps without any ties and fed with green fodder. In summer camps milking was organized in a similar way to this process in winter. Milking halls were a building of lightweight type with adjoining platforms, covered with sheds.

RESULTS AND DISCUSSION

In breeding work with dairy cattle the central place is occupied by accounting and evaluation of productivity indicators. The level of productivity of animals, in particular dairy cattle, is characterized by a direct relationship of phenotypic factors with genetic ones. However, the genetic potential can be fully manifested in the phenotype only at creating the necessary conditions for maintenance, full and balanced feeding, timely and proper milking. The investigated livestock was characterized by high indicators of milk content, as evidenced by the materials of table 1.

Animals of group I were inferior to their peers in terms of milk yield by 150.5 kg and 1.9 %, in terms of fat content – by 0.01 %, in terms of the amount of milk fat in natural indicators – by 7.2 kg and 2.2 %. As cows were holsteinized protein content decreased by 0.05 % (P>0.95). However, the increase in milk yields led to the fact that the amount of protein produced has not changed and reached the level of 265.9-267.0 kg.

Table 1: Milk productivity of cows during third lactation

Line	Milk yield for 305 days of lactation, kg	Fat content		Protein content	
		%	kg	%	kg
I group (7/8 BPH)					
M. Chieftain	7708,2±309,9	3,94±0,02	303,7±11,6	3,47±0,04	267,8±10,2
W.B. Ideal	7719,0±128,8	4,00±0,02*	308,8±5,0	3,37±0,01*	260,1±4,1
R. Sovereign	8029,7±249,8	3,99±0,03	320,4±10,2	3,35±0,01**	269,0±8,2
in the whole group	7819,0±136,0	3,98±0,01	311,2±5,2	3,40±0,02	265,9±4,4
II group (15/16 BPH)					
M. Chieftain	7794,3±169,5	3,98±0,02	310,2±5,4	3,35±0,01	261,1±5,4
W.B. Ideal	8021,6±212,5	3,96±0,03	317,7±7,8	3,33±0,01	267,1±7,3
R. Sovereign	8092,6±232,1	4,01±0,03	324,5±11,8	3,37±0,02	272,7±11,8
in the whole group	7969,5±165,0	3,99±0,01	318,0±6,2	3,35±0,01*	267,0±7,2

Note: hereinafter * - P>0,95; ** - P>0,99; *** - P>0,999.

Productive qualities of Holsteinized animals of III and IV generations were characterized as high as were much higher than the standard of Black-Pied breed for the third lactation on the yield of milk by 3619,0 –

3769,5 kg and 86.2 – 90,0 %, milk fat content – by 0,28 – 0,29 %; protein – by 0,35 – 0,40 %; amount of milk fat – by 156,2 – 163,0 kg and 100,8 – 105.2 %; the amount of protein – by 139,9 – 141,0 kg and 111,0 – 112,0 %.

At comparing the productive qualities of cows of different lines it was revealed that the advantage for the milk yield was on the side of the animals of the genotype R. Sovereign and was in relation to the counterparts of the line M. Chieftain 321.5 kg and 4.2 %, W.B. Ideal – 310.7 kg and 4.0% in the third generation, and fourth generation 298.3 kg and 3.8% and 71.0 per kg and 0.9 %, respectively.

Similar patterns are observed in the content of milk fat: in the first group 16.7 kg and 5.5 %, 11.6 kg and 3.8 %; in the second group 14.3 kg and 4.6 %, 6.8 kg and 2.1 %, respectively.

In the third generation the first place on a massive fat content belonged to the cows W.B. Ideal line. They showed the result by 0.06 % higher than data of genotype M. Chieftain peers ($P>0.95$) and by 0.01% in R. Sovereign). In the fourth generation, the identified trends remained, but the boundaries between the groups became less expressed.

On protein content in milk differences in the incision of lines were significant between animals of group I. The highest rate belonged to the analog of genotype M. Chieftain – 3.47%, which is higher than the result of the group of W.B. Ideal by 0.10% ($P>0.95$), R. Sovereign – 0.12 % ($P>0.99$). In group II, the range of variability was 0.04 % with a slight superiority of animals of the R. Sovereign line.

It should be noted that cows of different linear affiliation specifically responded to the increase in the proportion of blood on the Holstein breed. Thus, the peers of M. Chieftain group the increase of milk yield, fat content and the simultaneous decrease of the relative content of milk protein was observed. Animals of W. B. Ideal line responded with increased yield of milk, but on fat and protein content they reduced results. Holstein process had beneficial impact on all indicators of productivity only at analogs of R. Sovereign line. These patterns can be used in further breeding work of the plant to solve the issues of correction of individual productive characteristics.

Experts in the livestock industry point to the important role in the selection of dairy animals to assess the stability of their lactation activity; because stable lactation is the key to constant uniform milk production throughout the year without seasonal fluctuations.

The efficiency of milk production is also largely determined with such factors as the equalization and intensity of lactation throughout the productive period. Analysis of the coefficients of lactation persistence significant differences between 7/8 - and 15/16-blooded animals did not reveal. The data obtained (80.67 and 80.68%, respectively, for groups I and II) allow us to attribute the milk forming activity of cows to a high stable one.

In both groups the animals of line R. Sovereign take the leading position. In the III generation they showed the result at the level of 82.72 %, which is higher than the data of peers of the group of M. Chieftain by 2.51%, W. B. Ideal – by 3.64 %. In the fourth generation, similar data were 0.38 and 3.86%, respectively.

Violation of the reproductive capacity of cattle is currently one of the main problems of increasing the productivity of animals and the profitability of the industry as a whole. A special role in solving this problem, according to many scientists, should be given to the introduction of effective methods of activation and stimulation of reproductive function. However, these activities can have a positive effect only after elimination of deficiencies in the feeding, the maintenance and the exploitation of animals.

The high level of lactation causes restructuring of the whole organism, imposes increased requirements on the reproductive system of animals, often provoking various forms of infertility and subsequent culling of individuals. Experimental cows showed a tendency to decrease reproduction parameters in comparison with zootechnical standards (table 2).

Longer lactation (317.5 days) and subsequent service periods (101.0 days) were observed in 15/16-blood animals. Together, this led to an increase in the intercalving interval in peers of group II by 3.6 days and

1.0 % and the coefficient of reproductive ability by 0.010. When comparing the indices of fertility of cows of different genotypes, no significant intergroup differences were revealed.

Table 2: Reproductive qualities of cows of different genotypes

Line	Duration, days			KVS	Fertility index (Doha)
	Service-period	Dry period	Intercalving interval		
I group					
M. Chieftain	91,3±8,2	65,9±1,4	368,9±8,1	0,989±0,023	43,8±1,1
W.B. Ideal	100,4±2,7	63,7±1,0	375,0±3,6	0,973±0,009	46,5±1,0
R. Sovereign	104,5±5,1	59,5±1,2**	385,4±5,0	0,947±0,013	44,0±0,6
in the whole group	98,7±3,3	63,0±0,8	376,4±3,4	0,970±0,009	44,8±0,5
II group					
M. Chieftain	103,9±3,4	68,6±3,2	383,7±4,2	0,951±0,011	42,9±0,9
W.B. Ideal	97,2±6,1	57,0±1,9**	377,1±5,2	0,968±0,013	46,0±0,9*
R. Sovereign	102,0±4,6	62,0±2,0	379,3±4,9	0,962±0,013	44,3±0,8
in the whole group	101,0±2,7	62,5±1,5	380,0±2,7	0,960±0,007	44,4±0,5

In the context of the lines in the third generation the minimum service period was at mature cows-daughters of bulls of M. Chieftain genotype – 91.3 days, that is 9.1 days and 10.0 % more than at analogues of the W.B. Ideal group and 13.2 days and 14.5 % – R. Sovereign.

The established differences determined the optimal data of intercalving interval duration 368.9 days of the representatives of M. Chieftain line, which is reflected in the indicators of the coefficient of reproductive ability of cows. For the studied trait similar trends were reflected; the advantage of animals of the M. Chieftain genotype over peers was 0.016 and 0.042, respectively, on the lines of W.B. Ideal and R. Sovereign.

In the IV generation, the shortest period between calving and pregnancy was observed in cows of W.B. Ideal line – by 6.7 days and 6.9 % higher than daughters of bulls of the M. Chieftain group, R. Sovereign – by 4.8 days and 4.9 %, respectively. Intercalving interval with duration of 377.1 days (the closest to normal) is also a strong argument in favor of animals of this genotype. Counterparts of M. Chieftain line had 6.6 days and 1.8 %, R. Sovereign – 2.2 days and 0.6 %.

It is noteworthy that the experimental cows showed high quality in the duration of the dry period. In group I animals of R. Sovereign line faster went into the start-up – for 59.5 days, which is 6.4 days and 10.8 % (P>0,99) more than the same data of the cows of the M. Chieftain genotype and 4.2 days and 7.1% (p>0.95) – W.B. Ideal. In the IV generation, the shortest period was observed in the experimental W.B. Ideal group. Cows of M. Chieftain line surpassed them by 11.6 days and 20.4 % (P>0,99), R. Sovereign – by 5.0 days and 8.8 %.

The lower level of the fertility index was detected in animals of M. Chieftain line in both versions of the breed – to 43.8 and 42.9, respectively for I and II groups. From 7/8-blood cows, we also identified significant differences between animals of R. Sovereign and W.B. Ideal lines. The advantage of the latter was 2.5 units and 5.7 % (P>0.95). In the fourth generation analogues of W.B. Ideal group showed the result by 3.1 units and 7.2 % (P>0.95) above the data of cows of M. Chieftain genotype and 1.7 units and 3.8 % – R. Sovereign. Reproductive qualities of the experimental population of the studied genotypes were estimated at the average level.

Thus, the analysis of reproductive qualities depending on the breed of cows did not reveal significant differences, but there are trends in reducing the reproductive ability as the blood of animals in the Holstein breed. Cows of R. Sovereign line regardless of the breed showed the most prolonged service periods, which is probably connected with long lactations. However, according to general indicators, such as the reproductive capacity coefficient and fertility index, they occupied an intermediate position among peers of other genotypes.

The construction of large dairy complexes has dramatically increased the demand for breeding and productive qualities of bred genotypes of cattle and at the same time increased the importance of their

evaluation of the constitution and the exterior. Exterior-constitutional features of cattle are an indicator of health, direction of productivity, breed qualities. Therefore, the study of exterior features is an important part of the evaluation of the productive qualities of animals. Visual assessment of the body composition of the experimental livestock showed that all cows had a harmonious proportionally developed body, relatively high growth and strong bones. The head was characterized as light, dry, with a long face and average width of the forehead. The neck is thin, smooth, with numerous lateral skin folds. The chest is sufficiently deep and wide. The lateral profile was characterized by angularity, with a greater degree of development of the rear third of the trunk. Withers are high of average width, the back line is straight, and the waist is flat. During the inspection of the extremities of defects and failures are detected, the placing of the feet right, the rear wider than the front, which gives the reserve to the development of the udder in length. Ungulates horn in most cases is robust and smooth, but individual animals have loose fragile hooves. In general, the studied livestock had an expressed milk type, strong and tender dense constitution and corresponded to the signs of a Black-Pied breed.

In order to complement the analysis of exterior features, we calculated the main body indices. Animals of group I were superior to analogs of IV generation by leg length (1.2 %), thickness (1.8 %) and bone (0.2 %), but showed lower values of indexes of stretching (1.5 %), thoracic pelvis (1.0 %), thoracic (0.4 %) and height (0.1 %). Milk forms were more expressed in representatives of the R. Sovereign genotype.

Experimental animals were heavier and larger in comparison with the standard of Black-Pied breed – an average of 12.1 %. In cows of the III generation live weight reached 561.0 kg, which is higher than the data of analogues of the IV generation by 1.5 kg and 0.3 %. In the section of lines, the greatest fluctuations of the trait were observed in animals with blood 7/8 of the Holstein breed. Cows of M. Chieftain genotype were heavier than peers of W.B. Ideal line by 8.9 kg and 1.6 %, R. Sovereign – by 17.3 kg and 3.1 % ($P>0,95$). There were no significant differences in the IV generation.

Thus, the increase in the proportion of blood on the Holstein breed from 7/8 to 15/16 did not cause significant changes in the constitution of cows. In general, all animals met the requirements of the standard for Black-Pied cows of this age.

At organizing intensive milk production, along with high productive qualities, it is necessary to take into account technological features: morphological features of the udder, uniformity of its development, indicators of milk yield.

The udder of almost all animals was characterized as voluminous, extended forward under the belly, symmetrical, with the absence of external defects and shortcomings, tightly attached to the abdominal wall. The bottom of the udder is horizontal, high above the floor. The mammary glands of cows had a soft fine-grained consistency. The animals had a large stock of udder with many skin folds; milk veins were different in relief and well expressed.

The best morphological features had peers of group II, as they had more than 6.7 % animals with a bath-shaped udder, and vicious signs (goat and primitive udder) were not registered. The frequency of occurrence of the round shape was the same in both variants of the breed – 6.7 %.

Holstein process had a positive impact on the measurements of length, width and circumference of the udder. 15/16-blood cows outperformed their counterparts, respectively, on the listed indicators by 1.6 cm and 3.7 %, 1.9 cm and 5.0 %, 3.1 cm and 2.3 %.

In the analysis of the influence of linear affiliation on the characteristics of the mammary gland, it was found that more promising for the technology of machine milking are animals of W.B. Ideal and R. Sovereign genotypes. In group I, in the cut of lines on the length of the udder peers of M. Chieftain genotype by 5.3 cm and 13.1 % ($P>0.99$) and 4.2 cm and 10.4 % ($P>0.95$), on width – by 2.8 cm and 7.7 % ($P>0.95$) and 2.5 cm and 6.9 %, on girth of udder – by 9.7 cm, and 7.6 % ($P>0.99$) and 6.0 cm and 4.7% inferior to the analogues of the W.B. Ideal and R. Sovereign lines. In the IV generation these measurements in representatives of the M. Chieftain line were lower, respectively, 1.8 cm, and 4.1 % and 2.5 cm and 5.7 % ($P>0.95$); 0.7 cm and 1.8% and 1.6 cm, and 4.1 %; for 7.5 cm and 5.7 % ($P>0.95$) and 9.3 cm and 7.1 % ($P>0.95$).

The analysis of the functional qualities of the udder of the studied animals showed that the udder index showed high results in the whole sub-experimental population: from 46.4 to 48.4% depending on the genotype. There were no significant differences resulting from the influence of the cow genotype. However, the daughters of bulls of the R. Sovereign line were characterized by the best development of the anterior lobes in comparison with their peers (47.7 and 48.4%, respectively, in groups I and II). The intensity of lactation reached the level of 2.06-2.09 kg / min., which meets the requirements of the technology of machine milking and allows evaluating the functional properties of the udder of the investigated livestock as high.

When assessing the possibilities of intensification of the livestock industry on the basis of rational use of breeding resources, the analysis of the economic efficiency of milk production is decisive (table 3).

Table 3: Economic efficiency of milk production by animals of different genotypes (average per 1 head)

Line	Maintenance costs, rub	Basic yield of milk fat, kg	Cost of 1 centner of milk, rub	Profit, rub	Level of profitability, %
I group					
M. Chieftain	93707,0	8932,4	1049,1	39385,8	42,0
W.B. Ideal	94506,0	9081,2	1040,7	40803,9	43,2
R. Sovereign	94358,0	9423,1	1001,3	46046,2	48,8
in the whole group	94190,0	9145,6	1030,0	42079,4	44,7
II group					
M. Chieftain	94100,0	9123,9	1031,4	41846,1	44,5
W.B. Ideal	95271,0	9342,8	1019,7	43936,7	46,1
R. Sovereign	94935,0	9544,5	994,7	47278,1	49,8
in the whole group	94769,0	9337,1	1015,0	44353,8	46,8

It was revealed that cows of group II were characterized by lower cost of 1 centner of production (by 15.0 rubles and 1.5%). The explanation lies in the different levels of productivity of animals: 15/16-blood analogues produced milk of the highest grade fat content of 3.4% to 191.5 kg and 2.1% more than peers of the third generation, while increasing the cost of its content by only 579.0 rubles and 0.6%.

Analysis of profits shows that compensation costs are higher in animals of group II – 2274.4 rub and 5.4% per head. In many ways, this led to an increase in the profitability of milk production by 2.1 %.

The most appropriate in both variants of breed was the use of cows of R. Sovereign line; profitability reached 48.8 and 49.8 %, respectively, in the I and II groups. The analogues of W.B. Ideal genotype inferior to them – by 5.6 and 3.7%, and the animals of M. Chieftain line– by 6.8 and 5.3 %, respectively.

The current trend in the development of dairy cattle breeding shows that it is impossible to develop further the industry without the use of highly productive breeds of imported breeding, adapted to specific regions of use. In turn, the productive indicators, including genetic possibilities of holsteinized Black-Pied cattle and further use of perspective lines of Holstein breed on it to show the potential of milk productivity.

Thus, the world experience, as well as the results of our own research, are very diverse and ambiguous, and often contradict each other. This allows us to state that the realization of the potential of productivity largely depends on the gene pool of a particular population, the conditions of feeding and keeping animals, their operation mode, the organization of reproduction and other things.

CONCLUSIONS

Summing up the results of complex studies of economic and biological characteristics of holsteinized Black-Pied cows of different genotypes, it can be concluded that the work with the R. Sovereign line will allow obtaining for a full-aged third lactation from animals with a share of blood 15/16 to 9545 kg of milk of basic fat

content at a level of profitability of 49.8% in a high level of feeding. The high productive potential of cows of the studied genotype, excellent technological qualities of the udder, the strength of the constitution and the health of holsteinized Black-Pied white animals give the right to consider them the most popular in the current economic realities and able to meet fully the requirements of farmers and consumers.

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