



INFLUENCE OF GENETIC FACTORS ON PRODUCTIVE LONGEVITY OF DAIRY CATTLE



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Introduction

Radical genetic improvement of populations of domestic dairy breeds is conducted on the gene pool of the best foreign breeds, in particular Holstein. This approach has significantly improved the milk productivity of cows, however, it led to a significant reduction in their productive longevity, and so on. Therefore, it is important for scientists and specialists to study the influence of certain factors on the duration and efficiency of lifelong use of dairy cattle.

In view of the above, the aim of our research was to study the influence of different genetic factors on the productive longevity of Holstein, Ukrainian Black-and-White and Red-and-White dairy breeds.

Material & Methods

The research was conducted by the method of retrospective analysis of primary data zootechnical and breeding records in seven farms with Holstein cows, ten farms with Ukrainian Black-and-White dairy breed and in five farms with breeding Ukrainian Red-and-White dairy cows. Samples included animals whose first calving took place no later than 2008 and which left the herd after at least the first lactation lasting at least 240 days.

Results

It has been established that the indicators of the duration and effectiveness of life-long use of the daughters of long-lived Holstein breed were lower not only than their mothers, but also lower than the average Such Holstein of the herd descendants of Ukrainian Black-and-White, Red-and-White breeds had a little higher indicators of productive longevity, than the average per herd: lifetime yield was higher by 10.4 and 28.9% respectively, and the number of lactations for life — by 6.4 and 22.7% breeders as Rock 373840409, V. M. Dan 5510544, V. Teksel Kin 393522 (Canadian breeding), E. Samb 3035115974 (Hungarian selection), Lord 661288 (German breeding), Valentin 373840175, Matador 373840109 (Russian breeding) improved productive longevity of daughters by some separate features, and also the breeders of Ukrainian Black-and-White, Red-and-White breeds Abrykos 5806 and Khlor 2052.

The best indicators of productive longevity were the following: purebred animals of domestic breeds in comparison with crossbreeds; cows obtained out of the interlinear selection of parent pairs than intra-linear and inbred animals compared to out bred. Mild and close degrees cows differ markedly in terms of productive longevity from the remote and tight degrees.

The nonadditive type of inheritance cows for the first lactation characterized by a longer duration of productive use and higher lifelong yields than the ones with additive inheritance. During selection of cows with “over-domination” and “domination of the mother” and “domination of the father” the forms of yield inheritance should be preferred since these animals were characterized in most cases by the highest rates of duration of productive use and lifetime productivity.

Animals with mothers, fathers, mother of mothers, fathers of mothers, mothers of fathers and fathers of fathers in their breeding record which had positive values of breeding indices, inherited high yields, but the duration of their economic use was low. Correlation analysis shows that the most theoretically motivated and practically suitable criteria for forecasting of productive indicators of longevity is the yields of mothers for the first lactation ($r = -0.194...+0.084$) and breeding indices of ancestor by the father line (F, MF and FF) ($r = -0.283...+0.096$). At the same time, one-factor dispersion analysis has established that the most significant impact on the productive longevity of dairy breeds were made by the origin of the father ($\eta_x^2 = 9.9-29.3\%$, $P < 0.001$), conditional pedigree by Holstein breed ($\eta_x^2 = 5.8-34.3\%$, $P < 0.001$) and linear affinity ($\eta_x^2 = 4.6-19.8\%$, $P < 0.001$).



Conclusions

Thus, the most appropriate criteria for predicting productive longevity of dairy cattle among the genetic factors are the yields of mothers for the first lactation and selection indices of ancestral ancestors (F, MF and FF), and the most significant impact on the duration and effectiveness of lifelong use of cows was the origin of the father of the father, conditional pedigree by Holstein breed and linear affinity.