

Influence of the country of origin and linear affiliation on the lifetime milk production of Holstein cows in resource-saving technology

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The productive longevity of cows is a rather complex integral trait, which is determined by both genetic and environmental factors. Among the first ones, the origin of the animals and the lineage of the parents have a significant impact, due to the effective breeding, subject to strict adherence to the system of selection and assessment of animals by breeding value. Therefore, the studies carried out in the aspect of the paternal influence of origin and lineage on the indicators of lifetime productivity of dairy cattle are relevant and motivated. In this regard, the purpose of the study was to determine the proportion of the dispersion effect of the origin and lineage of Holstein cows on the lifetime milk production at industrial milk production technology.

The work was carried out on the livestock of imported animals of the Holstein breed of PJSC “Agro-Soyuz” of the Dnipropetrovsk region (48°28'44" N, 35°36'46" E) using data from the Orsek dairy management system. This enterprise was once a model farm for breeding animals of the Holstein breed using the information system for the selection of servicing bulls MAP (economically oriented assessment of options for selection) of the CRI company, which met the latest requirements of The International Committee for Animal Recording (ICAR) and the subcommittee International Bull Evaluation Service (Interbull). Using a ten-year database, imported animals of European origin (Danish, German and Hungarian) were randomly selected from the number of cows with completed lactation (Antonenko et al., 2018). Cows with incompleting one (less than 240 days) were excluded from the sample. For all animals, the value of lifetime milk yield (kg), milk fat yield and milk fat protein (kg) were taken into account. Data were presented as means \pm standard error of the mean and subjected to analysis of variance (two-way ANOVA) using the *Statistica v. 10* (StatSoft Inc., USA).

The distribution livestock of the European breeding cows by lineage was rather uneven. The highest lifetime milk yield among Holstein cows was in the Starbuck line, which surpassed their imported peers in other lines: Cavalier by 2819 kg (8%); Bell 3404 kg (10%); Valiant by 5554 kg (18%); Elevation by 7369 kg (25%) and Chief by 5501 kg (17%). It should be noted that the Starbuck cows also had relatively high milk fat and protein yields. According to these indicators, their superiority over cows of other lines was following: concerning Cavalier by 274 kg (20%) and 116 kg (11%); Bell by 190 kg (14%) and 65 (6%); Valiant by 390 kg (29%) and 288 kg (27%); Elevation by 385 kg (29%) and 244 kg (23%); Chief by 262 kg (19%) and 160 kg (15%). The applying of two-way analysis of variance was used to determine the share of the influence of the country of origin and the linear affiliation of cows as factors effecting the realization of lifetime indicators of milk productivity of cows. In particular, the proportion of the influence of the country of origin on the lifetime milk yield, the yield of milk fat and protein was up to 3%, with the greatest effect on the first indicator. The proportion of the influence of the linear affiliation of cows was slightly higher, and amounted to 8%, to a greater extent affecting the components of milk.

Two-factor analysis of variance found that part of the effect of linear affiliation on the lifetime milk yield was 5.5%, the yield of milk fat and protein was 6.3–7.8%. The part of the influence of the country of origin was even less: 0.5–2.6% (having a greater impact on the milk yield of cows).