генеруючи продукти метаболічного обміну, такі як коротколанцюгові жирні кислоти і комунікуючи з клітинами хазяїна за допомогою хімічних речовин. Ці механізми можуть призводити до антагонізму з потенційними патогенами, поліпшення середовища ШКТ, зміцнення шлунково-кишкового бар'єру, негативного зворотного зв'язку із запаленням та зворотного зв’язку з імунною відповіддю на антигенні виклики. Імовірно, ці феномени мають найбільш позитивні ефекти, що включають зниження частоти і тяжкості діареї, яка є однією з найчастіших причин застосування пробіотиків.

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DYNAMICS OF THE INFLUENCE OF PARENTAL ORIGIN ON CHANGES IN THE LEVEL OF PRODUCTIVITY IN A HERD

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Monitoring the level of productivity in herds makes it possible to assess the realization of the genetic potential of animals in specific environmental conditions (Khan et al., 2021), as well as the level of their welfare (Carvalheiro et al., 2019; Lozada-Soto et al., 2024). The existence of significant interbreed differences, as well as intergroup differentiation in terms of milk yield among cows of different origin by father, was proven in the work of S. Fil et al. (2019). In the work of Yu. Polupan et al. (2020) it was reasonably proven that the “father” factor has a more significant impact on milk productivity and the duration of economic use of cows compared to linear affiliation.

The current task is to investigate the level of influence of the father's heredity on the milk productivity of daughters under changing conditions of exploitation in the herd.

The research was conducted in the herd of the Khrystynivske research farm of the M.V. Zubets Institute of Animal Breeding and Genetics of the National Academy of Sciences of Ukraine on animals of the Ukrainian Red-and-White Dairy and Holstein breeds, taking into account periods of different levels of productivity in the herd. Data on the level of milk yield, fat and protein content in milk, milk fat and protein yield for a standardized period (305 days or a shortened lactation of not less than 240 days) of the first, second and third lactations were analyzed by comparing group means between 15 groups of half-sisters by father with more than 10 daughters (n = 1127). Calculations were carried out by methods of mathematical statistics using the software package "STATISTICA-12.0". The strength of the influence of the "father" factor on milk productivity traits was determined using a one-factor analysis of variance as the ratio of factorial and total variances (Kalinin & Yeliseyev, 2000).

During the observation period, two clusters with relatively similar milk yield of first-born cows can be distinguished. During the more productive period of 2014-2018 lactation, the average yield of 514 first-born cows was 6483 ± 51.8 kg of milk with a content of 3.83 ± 0.024% fat and 2.95 ± 0.018% protein. In the period from 2019 to 2022 calving years, the productivity of 502 first-born cows decreased on average to 5453 ± 40.9 kg of milk with a content of 3.90 ± 0.022% fat and 3.03 ± 0.011% protein. Therefore, there is a statistically significant ($P < 0.001$) difference in milk yield of first-born cows between the identified clusters, which persists in the subsequent second and third lactations ($P < 0.05$).

A comparative analysis of group means revealed a significant level of interbreed differentiation of milk productivity of cows during the period of higher productivity of first-born cows. During 2014-2018, first-born Holstein cows exceeded their peers of the Ukrainian Red-and-White Dairy breed in terms of milk yield by 264 ± 102.3 kg or 4.1% ($td = 2.58$, $P < 0.05$), in terms of milk fat yield by 8.3 ± 5.18 kg or 3.4% ($td = 1.60$, $P > 0.1$), and in protein yield by 12.5 ± 4.14 kg or 6.6% (td = 3.02, P < 0.01). During the 305 days of the second lactation, the advantage of Holstein cows is 307 ± 151.0 kg ($td = 2.03$, $P < 0.05$), 15.9 ± 6.92 kg ($td = 2.30$, $P < 0.05$) and 5.7 ± 5.91 kg ($td = 0.96$, $P > 0.1$), and during the third lactation - 665 ± 188.1 kg ($td = 3.54$, $P < 0.001$), 14.0 ± 8.51 kg ($td = 1.65$, $P < 0.1$) and 4.3 ± 6.64 kg ($td = 0.65$, $P > 0.1$).

Given the decline in herd productivity during 2019-2022, the interbreed difference in milk productivity of cows is practically leveled.

A comparative analysis of group means revealed a significant level of intergroup differentiation of paternal half-sisters during the period of higher productivity of the firstborn of the herd. During 2014–2018. The best milk yield in 305 days of the first lactation (6869± 206.4 kg) was

characterized by 17 daughters of Holstein breeding bulls Kandi Red TV Tl NL 444990835 and 85 daughters (6819 ± 109.4 kg) of Benaro Et Red TV NL 359855968. According to the results of the third lactation, it was established that the best milk yield indicators were characterized by the daughters of the bull Jornado Red TV DE 114386106, who had a statistically significant advantage (1112 ± 316.1 kg, $P < 0.001$) over the daughters of the bull Luchnov UA 471. During the period of decreasing productivity in the herd (2019–2022), no statistically significant difference in milk yield was established between the groups of half-sisters by the father.

Analysis of variance confirmed the different effects of paternal origin on chronologically varying levels of herd productivity. In the more favorable period of 2014–2018, the strength of the effect of paternal origin on cow yields for the first three lactations ranged from 7.5 ± 4.34% ($P = 0.020$) to 22.8 ± 7.42% ($P < 0.001$), on fat content – from 6.0 ± 4.83% ($P = 0.212$) to 21.1 ± 7.26% ($P < 0.001$), and on milk protein content – from 5.1 ± 6.72% ($P = 0.728$) to 18.8 ± 4.14% ($P < 0.001$). With a decrease in the average productivity of cows during the 2019–2022 years of first calving, the maximum level of the father's influence on the variability of daughters' milk yield during the first three lactations decreased to 7.1 ± 6.35% ($P = 0.357$), on the fat content in milk - to 16.6 ± 3.34% ($P < 0.001$), and protein - to 7.5 ± 3.83% ($P = 0.033$).

Thus, the realization of the hereditary potential of productive traits depends on environmental conditions. With a higher level of productivity in the herd, first-born Holstein cows are superior to their peers of the Ukrainian Red-and-White Dairy breed in terms of milk yield. With a decrease in the level of milk yield, no statistically significant interbreed differences in milk productivity indicators were found.

The analysis of variance showed that for the entire period under study (2014-2023), the heredity of the father had a statistically significant effect on milk yield - in first-born cows at the level of 18%, in second-lactation cows 10%, in third-lactation cows 15%; on the fat content in milk for the first lactation - 4.5%, in the second - 8%, in the third - 13%; on the protein content in milk for first-born cows - 11%, in the second lactation - 6.4%. Differences were found in the level and number of traits that are statistically significantly influenced by the heredity of the father during periods with different levels of milk yield in the herd.

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ASSESSMENT OF THE INFLUENCE OF GENETIC AND NON-GENETIC FACTORS ON THE GESTATION LENGTH IN DAIRY COWS (USING THE TTE ANALYSIS)

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TTE analysis is an abbreviation of the English term "Time-to-Event," which can be translated as "*analysis of time to a certain event*" (Harman et al., 1996a). It is a broader concept than "*Survival Analysis*", a branch of statistics that examines the probability of an object surviving to a certain age (Machin et al., 2006). Initially, these methods were proposed to address purely medical tasks, but recently the approaches used in "*Survival Analysis*" have been increasingly applied in engineering, economics, sociology, and other fields. All of them deal with the same type of data – that is, data representing the time interval between two events.

In dairy farming, these methods also began to be widely used starting from the 1980s (Thysen, 1988). However, the first attempts to construct and analyze survival tables for dairy cows, and thus