RESEARCH ON THE INFLUENCE OF GENETIC LINEAGE AND ENVIRONMENTAL FACTORS ON PRODUCTIVE AND REPRODUCTIVE PERFORMANCE IN ROMANIAN BLACK SPOTTED CATTLE

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Abstract

This study evaluates the quantitative and qualitative milk production traits, reproductive indices, and the effect of sire lineage in a Romanian Black Spotted cattle herd (Holstein-Friesian strain) managed on a dairy farm in Iasi County. The dataset was compiled from official milk performance recording (COP) records spanning 2024–2025. Data processing included statistical analysis of productive performance across completed lactations (38 cows), reproductive parameters, and seasonal monthly dynamics of milk chemical constituents. The mean recorded yield was 5,803 kg milk, with an average fat content of 4.11% and protein content of 3.69%. Seasonal dynamic analysis highlighted a marked impact of the hot season on milk composition, with milk protein dropping from 4.09% in November to a nadir of 3.15% in July, alongside an altered fat-to-protein ratio (1.27). Reproductive performance was high, exhibiting a 92% conception rate, a service index (services sire per conception) of 1.27, 100% prolificacy, and a calving interval of 372 days. Daughter grouping and ranking revealed superior genetic merit in progeny lines derived from the sires MARMORALL (up to 6,644 kg milk, 4.29% fat, and 3.57% protein in the 7th lactation) and MAIDAL ET (6,427 kg milk, 4.12% fat, and 3.73% protein). The resulting data indicate high genetic potential alongside strong environmental adaptability in the studied nucleus herd, providing reference criteria for targeted breeding selection and nutritional management adjustments during critical periods of heat stress.

Key words: *dairy cows, productive performance, reproductive parameters, sire lineage, milk quality*