## Impact of Age at First Calving on Milk Productivity in Polish Holstein-Friesian Cows

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The dairy industry is pivotal in Poland, with milk production reaching 12,387 million liters in 2022 [1]. Dairy consumption is widespread due to its nutritional value, including protein, fat, minerals, and vitamins [2]. Reproductive issues in high-yield farms impact production and cow health [3]. Age at first calving (AFC) is crucial in dairy cattle breeding, impacting reproduction and production [4]. This study assessed AFC's effect on milk productivity in 1235 Polish Holstein-Friesian cows in the Zachodniopomorskie Voivodeship. Animals were kept in free-stall barns with open ventilation and were divided into groups based on their AFC: the first group included animals calving up to 24 months (N=239), the II group comprised those calving at 24 months (N=302), the III – cows calving at 25 months (N=259), and the IV – cows calving above 25 months (N=435). Statistically analyzing results using T-test, Fisher's LSD test, and Pearson correlations, the herd averaged 12,114.07 ± 1830.73 kg milk yield, 447.80 ± 86.75 kg fat, and 404.06 ± 61.93 kg protein yield. Calving intervals varied significantly between groups III and IV. Highest fat content was in group IV (3.75 ± 0.49%) and lowest in III (3.66 ± 0.46%). Correlations were found between AFC and parameters in the first lactation and beyond. The herd's average fat yield was

447.80 kg, protein yield 404.06 kg, and calving interval 463.13 days. Shortening the interval maximizes milk production, while achieving early calving should consider heifer development to avoid negative impacts [5]. AFC effects on milk yield vary; optimal calving is between 22 and 26 months, as early calving can lower yield due to underdevelopment. AFC also impacts milk quality and somatic cell count [6]. Optimizing reproductive indicators, including AFC, is vital for dairy farm productivity and management.

*Literature available from the author/s.*