

Economic Selection Index in Dairy Cattle Farms

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Abstract

This study aimed to calculate economic values (EVs) and economic selection indices (ESIs) for milk production systems in small rural properties. The traits 305-day milk yield in kg (MY), fat (FP) and protein (PP) percentage, daily fat (FY) and protein (PY) yield, cow live weight in kg (LW), calving interval (CI), and logarithm of daily somatic cell count (SCC) in milk were considered the goals and selection criteria. The production systems were identified from 29 commercial properties based on the inventory of revenues and costs and of zootechnical field data. Later, bioeconomic models were developed to calculate the productive performance, revenues, and costs concerning milk production to estimate EVs, which were calculated as the difference in annual profit with dairy production resulting from a change in one unit of the trait while keeping the others constant and dividing the value by the number of cows. After the EVs were known, ten ESIs were estimated for each system so they could be compared by modifying the selection criteria (SC) and calculating the relative importance of each SC, the accuracy of the ESI, and response expected to the selection in USD, among other parameters. One of the systems detected was called less intensive (LS) and was characterized by having ten cows in lactation that produced 13.5 L/day and consumed 1.8 kg of concentrate/day. The second system detected was called intensive (IS) and had 22 cows in lactation that produced 17.5 L/day and consumed 3.4 kg of concentrate/day. Monthly profits of USD 26.04 and USD 1,512.83 were recorded for LS and IS, respectively. The EVs of the traits MY, FP, and PP were all positive, while for the other traits they were all negative in all situations. The best ESIs were those featuring SCs MY, LW, and CI, while the trait LW had the greatest importance in both systems. These results indicate that animal frame must be controlled in order to maximize the system's profit.