

ABSTRACT

Selection response from a two-tier nucleus breeding scheme using the current Kenyan breeding goal was compared with an alternative that also accounts for protein yield (PY) and mastitis resistance (MR). The economic value for PY was estimated using a bio-economic model. For mastitis resistance, like other disease resistance traits, the economic value cannot be estimated with profit equations because they have multi-fold effects on input and output, which affects profitability. Therefore, selection index methodology was used. Somatic cell count (SCC) was used as an indicator trait for MR. The ZPAN computer program was used to model the breeding schemes and evaluate response to selection. The alternative breeding goal, which included PY and MR, realized additional KES358.48, 613.55, and 613.65 in annual genetic gain, returns and profit per cow per year, respectively, compared with the current breeding goal. Economic values for PY and MR were KES778.99 and -2364, respectively. Relative economic values for milk yield (MY, kg), fat yield (FY, kg), protein yield (PY, kg), MR, calving interval (CI, days), preweaning daily gain (DG, g/day), postweaning daily gain (PDG, g/day), live weight (LW, kg), preweaning survival (SR1, %), postweaning survival (SR2, %), and length of productive life (PLT, days) were 23 689.80, 4 146.77, 34 665.50, -992.88, 33.66, 62.40, 159.80, 391.94, 987.04, 4 474.37, and 7.56, respectively. This implies that including milk quality traits such as PY in the breeding goal would optimize response to selection in dairy cattle production.

Keywords: breeding objective, economic values, genetic evaluation, milk quality, traits, udder health