

ABSTRACT

We tested hypothesis that inclusion of the disease resistance indicator traits in a dairy goats' breeding goal would result to increased profitability of smallholder farmers. Deterministic simulation was used to compare responses for breeding schemes without (Scheme I) and with (Schemes II, III and IV) disease resistance in the breeding goal. Faecal egg count (FEC) and somatic cell score (SCS) were used as the indicator traits for helminthosis and mastitis in goats, respectively. We also investigated the effect of risk aversion among the smallholder farmers on response to selection. The breeding structure consisted of a two-tier closed nucleus system, with recording and genetic evaluations being undertaken in the nucleus. Breeding schemes differed on the number of traits in the selection criteria and number of records used to estimate breeding values. In Scheme I, traits in the breeding goal included milk yield (MY), live weight (LW), average daily gain (ADG), doe mature weight (DMW), number of kids weaned (NKW) and survival rate (SR). Scheme II was similar to Scheme I, but included records of FEC and SCS measured immediately after weaning and during early lactation, respectively. Scheme III was similar to II, but with additional information on SCS recorded at mid-lactation, while Scheme IV was similar to III with more SCS information recorded in late-lactation. Our findings indicate that schemes that included disease resistance indicator traits in the selection criteria (Schemes II, III and IV) were 28, 24 and 19%, respectively superior in profitability to Scheme I. Profitability for Scheme II was 3.5 and 7.6% higher than for Schemes III and IV, respectively. The response to selection was maximized when the nucleus consisted of 4–5% of the does' effective population size and 20% of them were phenotyped for SCS. High risk aversion tended to result in low profits. This suggests that use of economic values obtained using low risk aversion models could overestimate the economic worth of a breeding program especially in smallholder production systems where farmers are risk averse.