ABSTRACT

Previous genetic and economic evaluation of beef cattle breeding programmes have used genetic and phenotypic parameter estimates obtained in different studies. Such parameters are heterogeneous because they are obtained from different locations, using different sample sizes and estimation methods. The consequence of using such parameters is underestimation or overestimation of potential genetic gains, leading to wrong investment decisions. The objective of the current study was to estimate consensus genetic and phenotypic parameter estimates for beef cattle in the tropics. Meta-analysis of productive, reproductive, adaptation and disease resistance traits was done to obtain weighted traits means, heritabilities, and genetic and phenotypic correlations. Estimates from 208 means, 119 direct and 50 maternal heritability, 42 direct genetic and maternal genetic correlations, 136 genetic and 93 genetic and phenotypic correlations, respectively, were used. A random effect model was used to include the variances within and between studies. Unweighted average direct heritability estimates ranged from 0.26 to 0.32, 0.08 to 0.40, 0.14 to 0.34, 0.18 to 0.67 and 0.30 to 0.35 for growth, reproduction, disease resistance, adaptation and carcass traits, respectively. Weighted heritability estimates for birth weight, weaning weight and yearling weight ranged from 0.18 to 0.26, while those for reproduction traits ranged from 0.02 to 0.09. Weighted maternal heritability estimates for growth traits ranged from 0.07 to 0.11. Carcass, disease resistance and adaptation traits were the least studied despite their great economic importance to beef production in the tropics. Direct maternal heritability estimates for birth, weaning and yearling weights were 0.26, 0.24 and 0.18, while the corresponding maternal heritability estimates were 0.07, 0.11 and 0.08, respectively. Genetic and phenotypic correlations for body weights ranged from 0.43 to 0.88 and 0.32 to 0.80, respectively. Yearling weight and final weight had the highest genetic correlation (0.88). The genetic correlations between body weights and growth rates were moderate to high (0.37 to 0.79). Weaning weight was negatively correlated with post-weaning daily gain (-0.12). Disease resistance traits had low to negative genetic correlations with body weight and growth rate traits (-0.06 to 0.01). Some traits reviewed in the current study were not given a lot of attention, and therefore more focus is required on disease resistance, adaptation and carcass traits. In spite of these limitations, the weighted parameter estimates reported here can be used to add value to beef cattle improvement programmes in the tropics.