Economic values for production and functional traits and assessment of their influence on genetic improvement in the Boran cattle in Kenya


Abstract

Economic values for production (sale weight in steers, SWs, kg and heifers, SWh, kg; dressing percentage, DP; consumable meat percentage, CMP and milk yield, MY, kg) and functional (cow weight, CoWT, kg; cow survival rate, CoSR, %; postweaning survival rate, PSR, %; feed intake of cows, Flc, heifers, Fih and steers, Fls, kg DM) traits were estimated for six production systems utilizing the Boran breed in Kenya. The influence of the estimated economic values on genetic improvement was also assessed using different selection indices. The six production systems were described according to their sale age, levels of input and final goal, namely, short-fed medium input beef (SMB); long-fed medium input beef (LMB); short-fed high input beef (SHB); long-fed high input beef (LHB); long-fed low input dual purpose (LLD); and long-fed medium input dual purpose (LMD). Two evaluation bases were considered: fixed herd size and fixed pasture input. In the fixed herd-size situation, the economic values for production (except MY in beef systems) and functional traits (except FI in all systems) were positive meaning a unit increase in genetic merit of these traits had greater influence on revenues than costs. As expected, the economic value for MY was negative in the pure beef systems (SMB, LMB, SHB and LHB) and positive in the dual-purpose systems (LLD and LMD). When compared with the economic values estimated in the fixed herd-size situation, in the fixed pasture input situation they were lower for feed intake in the three classes of livestock and other traits related to it in all systems. These traits were CoSR, CoWR, PSR, CoWT, SWh and MY. The economic values for CoWT in LLD and LMD were negative (KSh \(-11.14\) and \(-15.33\) respectively). The economic values did not influence much the direction of the genetic response in each trait in the different production systems. However, the magnitude of the actual gain was dependent on the index applied. The magnitude of the economic values for production and functional traits estimated in this study suggest that genetic improvement of these traits will have a positive effect on profitability of Boran cows kept in dual-purpose systems and when herd size is restricted. In beef systems, genetic improvement of MY will have a negative effect on profitability, especially when restrictions on herd size and feed exists.