

Table 2 present estimate of rate of inbreeding, actual and effective population size and ratios. The average breeding male to female ratio obtained in this study 0.22, 0.26 and 0.24 do not varies between production system and is similar to what Tada *et al.* (2013) reported for indigenous Nguni cattle of southern Africa. Though higher than the recommendation for commercial beef herd 0.05 (Mapiye *et al.*, 2009). The high number of bulls in the pastoral herds offers a chance to affect selection and to minimize the inbreeding rate resulting from some low bull fertility (Mapiye *et al.*, 2007). The effective population size (N_e) varies between farming system, a reflection of the actual population size, is on the high side

compared to what Tada *et al.* (2013) recorded but still within recommendation of 50 for breeds under threat owing to inbreeding (Wollny, 2003). A low N_e value can be attributed to the unequal breeding sex ratio in favour of females and overlapping generation from random mating with no defined breeding season (Felsenstein, 1971). Inbreeding rates less than 1% per generation and a N_e of 50 have been recommended to avoid inbreeding depression and to maintain genetic diversity at sustainable levels for populations in the mid-term (FAO, 1988). In all cases, the level of inbreeding was within the proposed level to conserve endangered domestic animals that would result in inbreeding rates of between 1 and 4% (Mapiye *et al.*, 2009).

Table 2 Estimate of rate of inbreeding and other parameter for the three cattle management system.

Parameter	Agropastoral	Pastoralist	Transhumance
Breeding male to female ratio	0.22	0.26	0.24
Actual population size (N_a)	76 ^c	94 ^a	82 ^b
Inbreeding effective population (N_e)	22.97 ^c	35.04 ^a	29.11 ^b
Increase inbreeding per generation (ΔF)	0.022	0.014	0.017
Ratio of effective pop size to actual pop (N_e/N_a)	29	28	29

Values with different superscript letter in each row t significantly different ($P < 0.05$).

Conclusion

It can be conclude that there is no significant variation in the herd structure of the various traditional cattle management systems similarly with low level of inbreeding rate it is an indication that the indigenous cattle population is not under threat.

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