

Year-round forage systems for beef cows and calves

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Introduction Beef cow systems in the USA are based on forages with little or no concentrates fed. Tall fescue (*Festuca arundinacea* Schreb. L.) is one of the important pasture forages in the lower Northeast and upper South (Allen *et al.*, 2001). Limited research has been conducted on year-round all forage systems based on cool season forages. Stockpiling tall fescue in late summer-early fall provides good quality forage that is usually grazed rather than harvested. Forage systems including tall fescue and clover (*Trifolium repens* L.) produced excellent performance in beef cows and calves, with minimum inputs (Allen *et al.*, 2001). The present experiment is a component of a larger initiative, Pasture-based Forage Systems for Appalachia. The specific objective of this experiment is to evaluate different forage systems for beef cows and calves.

Materials and methods Initially, 108 Angus crossbred cows were allotted to six forage systems with three replicates. The cows remained in the same systems thereafter, and received only the forage produced in the systems. Tall fescue was a component (45%) of each system. The systems were: 1) fescue-fescue/clover, three paddock system, 0.9 ha/cow; 2) same as system 1 except 0.7 ha/cow; 3) same as system 2 except rotationally grazed; 4) fescue, fescue/clover, alfalfa (*Medicago sativa* L.)-orchardgrass (*Dactylis glomerata* L.), rotationally grazed, 0.7 ha/cow; 5) fescue, fescue/clover, switchgrass (*Panicum virgatum* L.), three paddock system, 0.7 ha/cow; 6) fescue, fescue/birdsfoot trefoil (*Lotus corniculatus* L.), fescue/lespedeza (*Michx. cuneata* (Dumont) G. Don), three paddock system, 0.7 ha/cow. The three-paddock system was as described by Blaser *et al.* (1977). For all systems fescue was stockpiled in late summer-early fall. In the spring cows were oestrous synchronised, bred artificially, then exposed to bulls. Calves were creep grazed in all systems. Forages were sampled during the growing season to determine chemical composition and estimate forage mass.

Results Performance of cows and calves for the first two years is given in Table 1. Pregnancy rate was lower for year 1 (2001-02) than year 2. This is attributable to a serious drought and shortage of high quality forage. Ample forage was available in year 2, and is reflected in pregnancy rates of 89-100%. In year 1 pregnancy rate was lowest ($P < .05$) for system 1, and highest ($P < .05$) for system 3. There is no explanation for the low conception rate for system 1 in year 1. In year 2, pregnancy rates were not significantly different. Weaning weights of the cattle were satisfactory for all systems and differences in years 1 and 2 were not significant ($P > .05$). Crude protein content of the forages usually met or exceeded the levels required for beef cows (NRC, 1996). Fibre components (ADF, NDF) indicated that the available energy content of the forages was sufficient for the cows and calves.

Table 1 Performance of cows and calves

	Forage system					
	1	2	3	4	5	6
Pregnancy rate, %						
2001-02	56	78	89	67	78	67
2002-03	94	100	94	100	89	94
Calf weaning weight, 222 days, kg						
2001-02	238	247	235	237	230	236
2002-03	250	268	246	232	231	252

Conclusions The results indicate that the fescue based systems were satisfactory for beef cows and calves. The choice of system by beef producers will depend on resources available on the farm, and cost of establishing and maintaining the forages.

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