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## An Economic Assessment of Cattle Raising Enterprises in the Red Soils Region of China

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## An economic assessment of cattle raising enterprises in the Red Soils Region of China

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**Key words :** smallholders, forages, cattle, economics, Red Soils

**Introduction** Chinese cattle numbers have greatly expanded in the past 20 years; largely carried on small farms that have traditionally grown food crops. Limited use of specialised forages and poor knowledge of cattle feeding and husbandry is challenging the establishment of sustainable beef enterprises. Economic results are presented from an Australian Centre for International Agricultural Research (ACIAR) project that explored new forage options for the Red Soils Region of China, which covers 2.6 million km<sup>2</sup>. An economic model is applied to a smallholder farm located in Hunan Province, to identify the potential for these options to increase the economic welfare of smallholder households.

**Materials and methods** The potential economic impact of the forage production and cattle feeding strategies identified by the ACIAR project was explored with an economic model of a smallholder farm located in Chunqutang Village, Dao County, Hunan Province (MacLeod et al. 2006). The model is calibrated (Table 1) using census data collected by Hunan Agricultural University students (CSIRO 2004), and the impact of the forages is examined by comparing the whole farm crop-forages-livestock system, including the purchase of 3 steers 100kg steer<sup>-1</sup> fed a traditional baseline diet of low quality straws and residues (Case 1) with a diet of planted forages and straws (astragalus, napier grass) recommended by the project (Case 2). The liveweight gain of the steers is the mean value, respectively, of the control (150 gram steer day<sup>-1</sup>) and improved forages (0.6kg steer day<sup>-1</sup>) treatments of feeding trials at the Red Soils Experiment Station (CSIRO 2004).

**Table 1** Assumptions used for smallholder model.

	Baseline (Case 1)	Forages (Case 2)
No. of persons comprising household	4	Same
Number of labour units (adult labour equivalent)	2.75 per annum	Same
Maximum available off-farm labour (adult labour equivalents)	0.8 per annum	Same
Paddy land (rice X 2 crops, fallow)	3.8 mu	+ 2mu astragalus
Dryland cultivation (peanuts X 1 crop, fallow)	3.0 mu	+ 1mu napier grass
Native grassland	10 mu	Same
Cows (draught)	1 head	Same
Feeder steers purchased at 100kgs/liveweight .steer	3 head	Same
Pigs	3 head	Same

**Results and discussion** The option of feeding forages offers clear economic advantages with an increase in total household income of Y Rmb2253 (Table 2). While crops fail to return their full economic value for both cases, the positive value of forages (Case 2) reduces the loss. Both cattle and pigs make net economic losses under the low quality feeding regime (Case 1), but make positive returns with forages (Case 2). While off-farm income remains important for household income under both cases, the dependency is significantly reduced by the profitable cattle activity with forages.

**Table 2** Economic profit-baseline (Case1) cf. feeding forages (Case2).

	Farm activities		Livestock		Total farm	Off-farm	Total household
	Crops/forages	Livestock	Cattle	Pigs			
	Y Rmb	Y Rmb	Y Rmb	Y Rmb			
Case 1 (baseline)	-665	-1,214	-1,187	-26	-1,880	3,120	1,240
Case 2 (forages)	-632	1,004	979	25	373	3,120	3,493

### References

CSIRO (2004). Final Report-ACIAR Project AS/93/35, CSIRO Livestock Industries, Rockhampton.  
 MacLeod, N.D., Wen, S., and Hu, M. (2007). An economic assessment of forage options to improve the profitability of smallholder beef cattle enterprises in the Red Soils Region of China. Aust. J. Expt. Agric. 47:1284-96.

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