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The Traditional Cattle Farming System in the Dry Zone: A Case Study

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ABSTRACT. *A case study was conducted to characterise the dry zone traditional cattle farming system. The only genotype of cattle found was the indigenous zebu. The average herd size was 65±27 animals. Animals were allowed to graze on communal grazing lands during the day time and in the evening the animals were herded back home and kept in a night paddock. Calves below 3 months were left behind in a shed while those above 3 months were allowed to graze but separated in the evenings. Milking was done only in the morning. Calving was seasonal with majority (75%) of calving occurring from September to January. The calving interval was 342±37 days with a calving to conception interval of 56±46 days. The length of lactation was 181±65 days with an annual milk yield of 154 litres per cow. The daily milk collection was 10.5±5.3 litres per herd and the average milk yield per cow was 0.8±0.2 litres. The milk collection was highest during the months of December to May and lowest during the months of August to September. Milk was sold at a very marginal price to an organized milk collecting network. Old and young male animals were sold to a middle man when money was required. The major diseases were haemorrhagic septicemia (HS) and black quarter (BQ) and the incidence showed a seasonal pattern. Debility in all age groups during the drier months of June to September and diarrhoea among the young during the months of November to January were common. Average calf (<1 yr of age) and adult mortalities were 9.5% and 7.1%, respectively. Young animals (below 2 yrs) were more susceptible to HS and BQ. In many instances, sick animals were treated by farmers with veterinary drugs. The major income was from sale of animals*

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and was about 51% of the average income. The major expenditure incurred by the farmer was for veterinary treatment and/or drugs and for ropes. The entire operation was managed with family labour. The total annual expenditure was approximately Rs. 1439±1871 per herd.

INTRODUCTION

The dry zone of Sri Lanka extends over 65% of the total land area of the country and carries 73% of the total cattle and buffalo population (Rajaguru, 1986). With this vast resource, this area has been considered as the most promising area for cattle and buffalo farming. However, the area still contributes only about 20% to the total milk collection of the country (Dirksen, 1986; Soni *et al.*, 1991). Nevertheless, it provided almost all the meat requirement of the country in the mid 1980's (Rajaguru, 1986).

Over the last few decades, efforts have been undertaken with national and international assistance to improve the cattle and buffalo farming with the dual aim of enhancing the income to the rural poor as well as the national milk production. Improvements in productivity and management systems are important to ensure sustainability of cattle farming as the dry zone is rapidly undergoing changes with irrigated settlement schemes as well as with increase in human population.

To evaluate the present status, as well as to provide the baseline information for future planning, efforts have been made to characterise the cattle production systems in the country (Abeygunawardena *et al.*, 1993). This study was conducted with the aim of characterizing the dry zone traditional cattle farming system with a view to understand the salient features and also to identify the limitations and potentials.

MATERIALS AND METHODS

Location

The study was carried out during the period of August 1990 to May 1992 in a village called, Walpaluwa, at Anamaduwa in the district of Puttlam in the North-Western province of Sri Lanka. Within this village, 15 cattle rearing farmers were selected purposively.

Data collection

Data on cattle farming was collected through record sheets, which were provided to the farmer at the beginning of the study. A simple record sheet was designed and the farmers were trained to do the entries. Monthly visits were made to the study area and the relevant information extracted. The data collection was on herd size and composition, reproductive and productive performance, health and mortality and income and expenditure.

Statistical analysis

The mean, standard deviation, percentiles, maximum and minimum values for quantitative variables were calculated by simple tabular techniques.

RESULTS AND DISCUSSION

Herd composition and characteristics

The average herd size was 65 ± 27 cattle. The only genotype, as assessed on the phenotypic characteristics was indigenous zebu cattle. The herd size and composition varied considerably from location to location. Daniel and Wolf (1986) reported an average herd size of 16 while Abeygunawardena *et al.*, (1990) reported an average herd size of 26 for two different areas within the same province. In areas where the preferred use was for milk and also where the introduction of exotic genotype for cross-breeding programmes were successful, the herd size appeared to be smaller and high percentage of animals were those of crosses between indigenous and exotic animals (Abeygunawardena *et al.*, 1990; Abeygunawardena *et al.*, 1993). The female to male ratio in the herd was 3:1. However, the female to male ratio was 1:1 up to two years of age. The bull to cow ratio was 1:7 (Table 1). This was due to disposal of surplus males for meat.

Management

Animals were managed extensively. All animals except calves below 3 months of age were herded in the morning to a communal grazing land, which was located few kilometres from the farmers dwellings. The animals

were allowed to graze 7-8 hours and herded back in the evening. All except lactating cows and calves were kept in a paddock. Calves of lactating cows were kept in a small shed while lactating cows were tied to a post or tree in the homestead. The village tank was the source of water. This extensive management system where the feed was provided through the communal grazing lands was the characteristic feature in the production system prevailing in many areas of the dry zone (Abeygunawardena *et al.*, 1990).

Table 1. Herd composition

Age group (years)	Number of males	Number of females	male:female
<1	95(49.7)	96(50.3)	1:1
1-2	74(47.7)	81(52.3)	1:1
2-3	50(38.8)	79(61.2)	1:2
3-4	12(12.9)	81(87.1)	1:7
>4	18(4.4)	394(95.6)	1:22
Total	249(25.4)	731(74.6)	1:3

Note: Figures in the parenthesis give respective percentages

These animals were milked once a day in the morning. The calves were introduced to the cow before milking for 1-2 minutes to stimulate milk let down. Following milking calves were allowed to suckle mothers for 20-30 minutes. This limited suckling was practised for convenience and this differs from the free suckling found in most areas of the dry zone (Abeygunawardena *et al.*, 1992).

Uses

The most preferred use of cattle was for milk. Average milk yield per cow was 0.8 ± 0.2 litres per day and the average length of lactation was 181 ± 65 days, giving an annual yield of 154 litres per cow. Milk production was seasonal, and was related to the seasonal calving pattern. The average yield per herd was 10.5 ± 5.3 litres with the highest yield obtained during the months of December to May and the lowest during the August to September.

The average yield and lactation lengths reported in this study were similar to values reported for indigenous cattle in other areas of the dry zone (Wijeratne, 1970; Buvanendran and Mahadevan, 1975; Abeygunawardena *et al.*, 1992). As the milk production was relatively low compared to those of exotic zebu, the farmer was compelled to keep a large herd in order to receive reasonable return from the operation. At this production level, milk contributed 46% to the total income. Although, it was not stated by the farmer, the major avenue of generating income from cattle farming was selling animals for meat. Usually on the average 12% of the herd were disposed for meat which brought about 51% of the total income. This appears to be true for other areas of the dry zone (Abeygunawardena *et al.*, 1990). The cattle dung also provided an income. A lorry load of cattle dung was sold for Rs. 500 to Rs. 750 and the income from this was about 3% of the total.

The use of the animals for draught was non-existent in this cluster mainly due to the prolonged drought periods that prevailed in this area during the last several years. This was different from the traditional role of cattle which provided farm power for activities related to paddy cultivation. Reports indicated that even in some areas where paddy farming was done with irrigated water, animal power has been replaced by mechanical power.

Reproductive performance

Majority (75%) of the calvings occurred during the period from September to January. This peak calvings coincided with North-East monsoonal rains (Figure 1). The average calving interval was 342$\pm$37 days with a range of 298 to 516 days. Eighty two percent of the calving intervals were less than 365 days. The calving rate was 70%. These findings suggested that the reproductive performance of indigenous cattle were near optimum. The high level of fertility ensures the herd has adequate number of animals for disposal annually for meat. This finding is in contrast to the popular belief that the indigenous cattle are poor reproducers. The high fertility appears to be a major factor which ensures the sustainability of the operation. As shown in Figure 1 calving was synchronized with the seasonal rainfall. Studies on indigenous buffaloes have shown similar calving pattern and suggested that the stimulation of postpartum ovarian activity by the seasonal pasture and fodder availability associated with seasonal rainfall as the major environmental factors for the seasonality (de Silva *et al.*, 1985;

Perera *et al.*, 1987; Abeygunawardena *et al.*, 1993). This may also hold true for indigenous zebu cattle too.

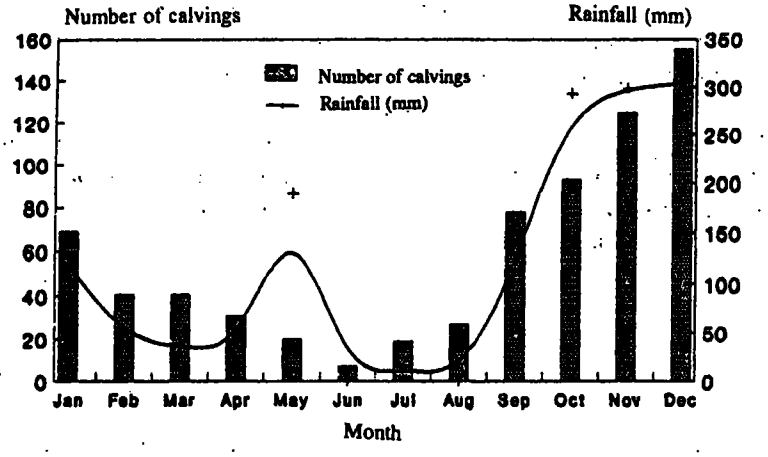

Figure 1. Calving pattern of indigenous zebu cattle in the dry zone.

Health

The major disease conditions which affected the cattle were Haemorrhagic Septicaemia (HS) and Black Quarter (BQ). This observation was based on clinical signs and no attempt was made to perform laboratory tests to confirm the diagnosis. The incidence of these as well as other diseases showed a seasonal pattern. During the period of June to January, the disease occurrence rate was high and the incidence rates were 3.2% and 3.1%, for HS and BQ respectively. Other common abnormalities noted were diarrhoea and debility. Diarrhoea was observed mainly in calves and the incidence was high during November to January. Debility in all age groups was seen during June to September which were the drier months of the year. The incidence and mortality rates for various disease conditions are given in Table 2. The overall calf and adult mortality rates were 9.5% and 7.1% respectively. In many instances farmers used prescribed drugs for variety of illnesses. This practice was necessary because the veterinary care was inadequate. This was also reported in earlier studies on the dry zone (Abeygunawardena *et al.*, 1990).

Table 2. Incidence of diseases and clinical conditions.

Cause	Number of cases reported	Number of animals died	Incidence rate (%)	Mortality rate (%)
HS	36	35	3.17	3.08
BQ	35	24	3.08	2.11
Debility	26	26	2.29	2.29
Diarrhoea	96	58	8.44	5.10
Other	61	13	5.36	1.14

Mortality was depend on the number of animals died in the susceptible population

$$\text{Incidence rate} = \frac{\text{number of cases reported}}{\text{total number of animals}} * 100$$

Income and expenditure

The income from cattle farming was earned from three avenues (Table 3). Selling animals for meat brought the highest income and was about 51% of the total income. Milk and cattle dung brought 46% and 3% respectively to the total income. The total annual income was Rs. 43216$\pm$18290. The income from milk was brought during the November to February and income from meat was high during the drier months of the year. A similar income earning pattern was shown in earlier reports in many parts of the dry zone (Abeygunawardena *et al.*, 1990; Ratnayake *et al.*, 1992). The data showed that, the dry zone farmers earned relatively high income from cattle farming. This was presumably due to availability of communal grazing lands and also due to well adopted, highly fertile indigenous zebu animals.

As shown in Table 3, the major cost involved in cattle farming were for drugs, hired labour and for ropes. As the disease occurrence and calving pattern were seasonal, the expenditure pattern also showed a seasonal variation. High cost incurred for drugs during the months from June to October. Only very few farmers used hired labour. Otherwise it was a family enterprise without depending on outside labour.

Table 3. Annual income and expenditure.

	Source	Amount(Rs.)
Income	meat	23805.19± 16825.13
	milk	19726.41± 11834.00
	manure	2400.67± 1580.61
	Total	43216.09± 18290.24
Expenditure	medicine	304.35± 259.24
	deworming	89.97± 136.99
	ropes	226.60± 74.05
	hired labour	1123.14± 1994.86
	Total	1438.56± 1870.85

The average annual cost for cattle farming was Rs. 1438±1871 and it was about 3% of the total income. For this calculations, the family labour was not considered as an expenditure item since the opportunity cost of family labour was considered to be zero. The estimated cost of production of one litre of milk was Rs. 0.4±0.4 and this was similar to the value reported by Ratnayake *et al.*, (1992) for the dry zone farming system.

The cattle farming system found in this selected village, a representation of the area, was a very low cost production system which brought modest income to the farmer. Further, there exist seasonal variations in reproduction, production, health, income and expenditure. The basis for this low cost production system appears to be the well adopted and fertile indigenous zebu and the existence of communal grazing lands. The system, nevertheless is faced with many constraints. The utilization of land for more irrigated agriculture and also for human settlement, has brought severe limitation for the sustainability of this low cost production system. Therefore, future sustainability of this system would very much be dependent on the man's ability to maintain fewer animals with high productivity, both in milk and meat. This kind of transformation, however will require strong support system and breed improvement programmes.

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