# Present status of neat cattle farming in Pelwatte Sugarcane growing settlements

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## Abstract

*Baseline data were collected on neat cattle farming systems in Pelwatte sugarcane growing areas. Sixty-two farmers were randomly selected from five settlement divisions and interviewed using a structured questionnaire. With the aim of improving the sustainability of farmer income, dairy farming was introduced to these areas by the stake holders as a part time occupation. However, dairying has now become an important viable family agro-industry for many people, especially due to major involvement of women and children. Main purposes of rearing neat cattle were for milk production and to supply draught power for cane fields and household activities. Atypical herd composition was found with a male to female ratio of 2:5. Main method of feeding was partial grazing. They were tethered in marginal lands, roadside verges, riverbanks etc. for a maximum of approximately of 8 hours during the day and tethered in back yard during the rest of the day. Crop residues such as straw, jack offals were fed to animals by 50% farmers in addition to grazing. Only about 20% farmers cared about calf management practices such as colostrum feeding, naval treatment, deworming, bathing etc. Most of the farmers (95%) offered water only during the rainy season. Only 5% farmers kept records by way of memory. Majority of farmers (85%) were interested in developing feeding strategies with available resources such as sugarcane tops, urea molasses feeds etc. but more extension is needed for this purpose. This system could be classified as a zero input system but farmers have great expectations to obtain sufficient income by selling of milk. The major constraints were; no market facilities for sale of milk and unavailability of water and feed during the dry season. Through a low input system and farmer awareness, this condition could be greatly improved.*

**Keywords:** Crop residues, dairy farming, drought power, grazing Pelwatta sugar fields, sustainable systems

## Introduction

Live stock has played a key role in rural subsistence agriculture in Sri Lanka. 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 dairy cattle farming.

At the present level of production and consumption of milk from cattle and buffalo is estimated to meet only about 20% of the total market share of the country. In order to meet the total requirements, the country spends billions of rupees to import milk and milk products (Central Bank Report, 2001). As such, successive governments have given high priority to this sector. Yet the improvements in the sector have fallen below expectations and the country has continued to experience heavy losses by resorting to importation of meet and milk to meet the local demand. There is a growing need to revitalize the industry in the face of vast and rapid changes occurring in the socio economic spheres of the country to ensure its sustainability.

Sugarcane cultivation is the predominant, agriculture activity in Pelwatte area. With the aim of augmenting the farmers income, dairy farming was introduced to these areas by the stakeholders as

a part time occupation. In recent years, due to renewed interest in dairy cattle, many farmers have started this enterprise as a sideline activity. Many smallholder farms have limited resources available for feeding their animals, especially during the dry season. Most of the farms are unable to select even basal diet according to the requirement for production during the period of feed shortage.

Baseline data on existing systems of management, production, reproduction and nutrition which are specific to Pelwatte area are scanty. Therefore, aim of this study was to collect some of important thebase line information on present status of neat cattle farming in Pelwatte settlement divisions.

## Materials and Methods

### Identification of neat cattle farmers and collection of data
A "house to house" survey was conducted in five settlement divisions in Pelwatte area. Sixty-two farmers were randomly selected from five settlement divisions. Individual interviews using a structured questionnaire was used to collect information from farmers.

The main sections of the questionnaire were as fallows:
- Purpose of rearing neat cattle
- Herd composition
- Feeding practices
- Calf management practices
- Milk production
- Problems associated with dairy farming

### Data analysis
Microsoft Excel version 7 and statistical analyses system, Cary. U.S.A. were used for data management and statistical analyses.

## Results and Discussion

### Purpose of rearing neat cattle
Main purposes of rearing neat cattle were for milk production (85%) and to supply draught power (15%) for cane fields and household activities. Out of the total number of farmers interviewed, fresh milk has been used for home consumption (80%), while others (20%) have sold it. Curd was mainly made-out of excess raw milk and was sold by 35% of farmers, while only 65% used it for home consumption.

For draught, purposes, mainly male animals were used. Male animals were used for work in cane fields by 10 % farmers. Draught animals were used for household activities such as hauling of wood blocks etc. Home garden crop production depends primarily on the supply of draught animals and animal manure. Draught animal played a key role in tillage of land, while animal manure fertilized field crops. Seresinhe and Pathirana (2000) also reported that traditional neat cattle farming systems consisting indigenous animals generally have low average herd sizes and atypical herd composition.

### Herd composition
Atypical herd composition was found with a male to female animal ratio of 2:5. The only genotype as assessed on the phenotypic characteristics was indigenous zebu cattle and their crosses. The farm mean was 9.3±5.2, represent a number of animals in a normal neat cattle herd in Sri Lanka (Abeywansa et al., 1993). The total number of cows were lowest in block 3 (51) and highest in block 4 (245). It appears that the total herd has been generally limited to the availability of land for grazing. Small extents of sugarcane lands, abandoned due to salinity problems have been converted to traditional

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grazing areas in block 4. As a result, the total number of cows raised has been larger in this area. The extent of such grazing land was limited in blocks 3 and 5, the total number tended to be smaller. However, herd size per farmer was lowest in block 3 (9.2), while it was highest in block 4 (17.5). The herd size and composition varied considerably from block to block. It was also evident that the total herd size mainly depends on the availability of feed resources Daniel and Wolf (1986) reported an average herd size of 16, while Abeygunawardena et al. (1990) reported an average herd size of 26 for the dry zone of Sri Lanka.

## Table 1. Herd composition of neat cattle in the five settlement divisions

| Settlement division | Lac. cows | | Dry cows | | Heifers | | Male calves | | Female calves | | Stud bulls | | Total herd | Herb size/farmer |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | | |
| Block 1 | 26 | 23.6 | 23 | 20.9 | 25 | 22.7 | 16 | 14.5 | 10 | 9 | 10 | 9 | 110 | 9.2 |
| Block 3 | 10 | 19.6 | 12 | 23.5 | 16 | 31.3 | 5 | 9.8 | 4 | 7.8 | 4 | 7.8 | 51 | 4.6 |
| Block 4 | 69 | 28.2 | 37 | 15.1 | 18 | 7.3 | 29 | 11.8 | 40 | 16.3 | 52 | 21.2 | 245 | 17.5 |
| Block 5 | 15 | 24.6 | 13 | 21.3 | 8 | 13.1 | 8 | 13.1 | 9 | 14.8 | 8 | 13.1 | 61 | 5 |
| Block 11 | 36 | 27 | 27 | 20.3 | 23 | 17.3 | 17 | 12.8 | 14 | 10.5 | 16 | 12.0 | 133 | 10.2 |
| Total | 156 | | 112 | | 90 | | 75 | | 77 | | 90 | | 600 | |
| Mean | 31.2 | 24.6 | 22.4 | 20.22 | 18 | 18.34 | 18.34 | 12.4 | 15.4 | 11.68 | 18 | 12.62 | 120 | 9.3 |
| ±SD | 23.4 | 3.3 | 10.4 | 3.1 | 6.7 | 9.2 | 9.2 | 1.7 | 14.2 | 3.7 | 19.5 | 5.3 | 77.7 | 5.2 |

## Feeding practices

Main method of feeding was partial grazing (90%). Animals were tethered in marginal areas and roadsides, river banks etc. and grazed for about 8 hours during the day and tethered in back yard during the rest of the day. Tethering was practiced especially to prevent them from destroying the canecrop. Only 5% farmers practiced free grazing system for neat cattle. Under free grazing system, cows were allowed to graze 6 to 8 hours during the day and never received cut fodder after grazing. Cut and carry system (5%) was adopted for cattle when grazing lands were located very far from the farm and also under adverse climatic conditions. Under zero grazing system, cows were stall fed on cut grass, about 26.2±7.2 kg/cow/day throughout the day.

Crop residues such as straw, jack offal's, sugarcane tops, were fed to animals by 50% farmers in addition to grazing. The most common grass found was *Panicum maximum* (Guinea A). *Gliricidia sepium* was the most familiar tree legume fodder. Rice straw has been fed more to bulls than cows. However, this practice will be more useful for milking cows under the grazing conditions with indigenous zebu cattle and their crosses in Pelwatte area.

Pathirana et al., (1996); Pathirana et al., (1995) reported that cattle production in a low input-output system can be improved by introducing crop residues. Crop residues plus low level of appropriate supplements such as concentrates, minerals etc. and tree fodder will be more useful for milking cows under the grazing condition. Pathirana, (1984) demonstrated the importance of supplementation of crop residues as a basal diet for milk production in ruminants, while Jayasuriya (1982) emphasized the benefits of feeding treated crop residues to ruminants. Farmers do not pay much attention to animal feeding due to the zero input system and low milk production. Ratnayaka et al. (1992) and Abeywansa et al. (1993) also found a similar situation in the dry zone. Therefore, greater farmer awareness is required to improve farming in those divisions. Additional feed resources could be introduced to improve the production potential of these animals.

There is good potential to improve feeding of tree fodder under those feed limiting conditions. 65% percent of farmers had back yard legume tree fodder, which was offered only 25% of farmers. Other farmers (40%) believed that tree legume fodder is unpalatable. Mohammed (1986) reported leguminous fodder has been found to provide adequate dry season supplementation and improved

the productivity of grazing cattle. Ehoche et al. (1999) reported increased body weight in cows supplemented with legume fodder.

Majority of farmers (85%) were interested in developing feeding strategies with available feed sources such as sugarcane tops, crop residues, urea molasses feeds etc., but more extension is needed for this purpose. The use of Agro-industrial by-products was negligible. Concentrates and minerals (8%) were also offered to cattle in this area. This could be considered as a very rare feature in cattle feeding, especially in Pelwatte settlement divisions. In fact, greater attention in feeding of concentrates and minerals, observed in surveyed area could have been to the lack of extension services. The availability and quality of feed fluctuated due to the seasonal pattern of forage production. Cattle are dependent on such feed sources; supplementary feeding is essential during the dry season. However, cattle farmers seldom practice supplementary feeding in the dry season, because of scarcity and high cost of conventional concentrate feeds.

## Table 2. Feeding practices used by farmers in Pelwatte settlement divisions

| Settlement | Legume feeding (%) | Straw feeding (%) | Sugarcane tops feeding (%) | Concentrates feeding (%) |
|---|---|---|---|---|
| Block 1 | 25.0 | 25.0 | 33.3 | 25 |
| Block 3 | 18.2 | 27.3 | 27.3 | 0.0 |
| Block 4 | 35.7 | 14.3 | 28.6 | 7.1 |
| Block 5 | 16.7 | 18.3 | 25.0 | 8.3 |
| Block 11 | 30.8 | 30.8 | 30.8 | 0.0 |
| Mean | 25.3 | 21.1 | 29.0 | 8.0 |
| ±SD | 8.1 | 6.7 | 3.2 | 10.2 |

## Calf management practices

Most of the farmers (95%) offered water only during the rainy season. Only about 20% farmers cared about important calf management practices such as colostrums feeding, naval treatment, deworming, bathing etc. Only 5% farmers kept records that are also by memory. Traditional methods were more popular among the farmers with regard to prevention of naval infection. For deworming the use of western method was more popular than traditional methods. However it was found that there is room for improvement of calf management practices in this area. Calf mortality was influenced by herd management, age and season. High mortality (80% of total mortality) was recorded during the dry season, mainly due to scarcity and unavailability of feeds.

## Table 3. Calf management practices used by farmers in Pelwatte settlement divisions

| Settlement divisions | Colostrum feeding (%) | Western (%) | Eastern (%) | Total (%) | Western (%) | Eastern (%) | Total (%) |
|---|---|---|---|---|---|---|---|
| Block 1 | 58.3 | 25.0 | 16.7 | 41.7 | 33.3 | 8.3 | 41.6 |
| Block 3 | 9.0 | 18.2 | 9.0 | 27.2 | 18.2 | 0.0 | 18.2 |
| Block 4 | 14.2 | 0.0 | 7.5 | 7.5 | 14.3 | 0.0 | 14.3 |
| Block 5 | 8.3 | 16.7 | 0.0 | 16.7 | 8.3 | 0.0 | 8.3 |
| Block 11 | 7.6 | 0.0 | 7.7 | 7.7 | 15.3 | 7.6 | 22.9 |
| Mean | 19.5 | 12.0 | 8.1 | 20.2 | 17.9 | 3.2 | 21.0 |
| ±SD | 21.9 | 11.4 | 5.9 | 14.5 | 9.3 | 4.4 | 12.7 |

## Milk production

The average milk yield was $1.25 \pm 0.5$ liter per day. Milk production was seasonal and was related to the seasonal calving pattern. Also, milk yield varied according to the monthly rainfall distribution and closely linked with the availability of forage, both quantity and quality. The highest milk yield was obtained during October to December and the lowest during June to August. Milk production

mainly depended on the apparent good condition of the animal, which was highest during the rainy season. Dry zone of Sri Lanka still contributes only about 20% to the milk collection of the country (Dirksen, 1986; Soni et al., 1991). The average length of extraction of milk for human consumption was 7.7±1.1 months. The lactation lengths reported in this study were similar to values reported for indigenous zebu cattle crosses in other areas of the dry zone (Wijeratne, 1970; Buvanendran and Mahadevan, 1975; Abeygunawardena et al., 1992). Milk off take started 1 to 2 months post calving, prior to which the entire production was consumed by the calf. Milking was a female dominated activity (62.5%) compared to the involvement of male (37.5%) participations. 80% of farmers who participated in the survey, milked their cattle at least once daily. The calves were introduced to the cow before milking for 1 to 3 minutes to stimulate milk let down. Following milking, calves were allowed to suckle mothers for 20 to 30 minutes. The selling price of fresh milk ranged from Rs.11.50 to 12.50. The selling price of curd ranged from Rs.50 to 60 per pot depending on the volume of milk in the pot. Curd fetched a better price than liquid milk, although manufacture of curd involved additional work. However, the advantage of curd production was that it helped to overcome the difficulties experienced in the immediate disposal of liquid milk and lack of storage facilities to prevent milk spoilage.

**Table 4. Milk yield, lactation length and milking practices**

| Settlement divisions | Milker (Gender) | | Lactation length (Months) | Average milk yield (l/day/herd) |
|---|---|---|---|---|
| | Female (%) | Male (%) | | |
| Block1 | 75.0 | 25.0 | 8.9 | 5.5 |
| Block 3 | 66.7 | 33.3 | 8.7 | 4.9 |
| Block 4 | 70.0 | 30.0 | 7.2 | 8.4 |
| Block 5 | 54.5 | 45.5 | 7.0 | 4.5 |
| Block 11 | 75.0 | 25.0 | 6.5 | 6.4 |
| Mean | 68.2 | 31.8 | 7.7 | 5.9 |
| ±SD | 8.5 | 8.5 | 1.1 | 1.6 |

**Problems associated with dairy farming**
The most prevailing problems were low veterinary coverage and poorly developed milk collection network. Other major constraints were unavailabity of water and feed during the dry season. These constraints were highlighted by Ozawa et al. (1978); Bandara (1993), under dry zone conditions but the same constraints still exist, limiting the productivity and sustainability.

Most farmers in Pelwatte area (80%) milked animals mainly to produce milk for home consumption, and only excess raw milk was used for curd marking, due to market problem. Due to this reason, they had to use 80% of milk for family consumption. However, this condition would help to upgrade the nutritional standards of their families. Cattle farmers seldom practice supplementary feeding (8%) in the dry season due to the scarcity and high cost of concentrate feed.

**Conclusions**

Data indicated that there is a good potential to improve the dairy production through the introduction of low inputs such as drinking water *ad libitum*, tree legume fodder, rice straw, minerals, together with low levels of other critical supplements (rice bran, urea, molasses) into the existing feeding system. Use of sugarcane tops during the feed scarcity would be also an alternative strategy .Introduction of artificial insemination is another important factor. Indications are that through the use of low inputs and farmer awareness existing condition could be greatly improved.

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