

A Comparison of Performance of Productive and Fertility Characters of Dairy Cattle in Dairy Villages and Non Dairy Villages

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Abstract

Dairy villages were introduced to Sri Lanka to increase local milk production. The study investigated the effectiveness of dairy village concept in terms of improving productive performance. Study was done in a "dairy village" and a "non dairy village". One hundred and forty semi-intensive farms were selected using purposive sampling technique and were studied using a structured questionnaire survey. Most of the farmers in dairy village milked their animals twice a day whereas; most of the farmers in non-dairy village did morning milking only. Dairy village stock-keepers' achieved low calving interval around 14 months. Number of inseminations per conception was significantly lower in dairy village than in non-dairy village. Results of the study signified that the average milk production in dairy village is not significantly different from non-dairy villages. However, reproductive management practices were better in dairy village farms. It was concluded that Dairy village concept was not effective in increasing average milk production and therefore, a better program is recommended.

Key words: Dairy village, Non-dairy village, Milk production

Introduction

The demand for milk and milk products is increasing every year in the country. However the local milk production has not increased to meet the increasing demand that witnessed during the last few decades. Only a 20% of the milk requirement is produced locally and balance is imported, spending large valuable foreign exchange every year (Central bank report, 2012). Therefore, government has given a top priority for dairy development in the country as it influences the Sri Lanka's economy to a great extent.

Dairying is an important traditional economic activity in Badulla district, which contributes 9% to the total milk production of the country. *Welimada* area in the same district has recorded the second highest milk production in the district, (Progress review report, Department of Animal Production and Health, Uva Province, 2008). This area has been identified as an important area for dairy development. In view of increasing milk production in

the country, government has established "Dairy Villages" concept in milk producing areas to enhance the productivity through proper management under the guidance of the Department of Animal Production and Health (DAP&H). A total of five dairy villages have been established in Welimada under the said by the program in 2011. These farmers are provided with required inputs and supporting services. The information on dairy farming in the area is somewhat scanty and only a few studies have been carried out in the recent times. Therefore, this study investigated the effectiveness of dairy village in terms of production parameters such as average milk production of animals, peak production, length of lactation, calving interval and number of inseminations per conception and compare them with the performance of non dairy villages.

Materials and Method

Location of the study and selection of farms

The study was carried out in *Welimada* division in *Badulla* District. *Welimada*, lies at latitude 6.9011°N and eastern longitude 80.92280 °E. Average annual rainfall in the region is 1900mm. The climate is mild and the day temperature varies from 12°C-21.5 °C and nights are cooler. The Relative humidity is around 75%.

For the study 140 semi intensive farms were selected using purposive sampling technique based on two categories of village namely Dairy village (*Kirigammana*) and Non-dairy village, and three categories of farm size according to the number of animals in each farm. The farm sizes were, small (Total number of animals ≤ 3), medium (Total number of animals 4-7) and large (Total number of animals ≥ 8). A total of 25 small, 25 medium and 20 large scale farms were selected for the study.

Data collection

To evaluate the existing situation of productive performances of the dairies, a field survey was conducted using a pre-tested structured questionnaire and they were evaluated individually by direct observations, through gathering information from the farmers and with the help of the available records at the farms as well as at the veterinary surgeons office in *Welimada*.

Data analysis

Data were analyzed using SAS 9.1.3 software package. Means were separated by least square means.

Results and Discussion

There were 2250 registered farmers in the studied area and total dairy cattle population was around 12,500 (Unpublished data, Veterinary office, *Welimada*). The main livelihood of the farmers in Dairy villages was dairying while around 60% of the farmers in Non Dairy villages engaged in dairying full time. However, most

farms were integrated with vegetable cultivation in addition to dairying. The majority of the farmers were traditional farmers with more than 25 years of experience in dairy farming and the rests was ere new to the industry.

Breed Characteristics

Existing dairy population in *Welimada* dairy division mainly includes upgraded animals with European breeds (Table 1) Most of the farmers prefer either Friesian or Jersey cross bred animals. However, the medium scale farmers have a preference for Jersey graded animals rather than Friesian. The animals of non descriptive type and *Ayreshire* crosses were few, comparatively. Average age of the animals in different village categories vary 39.2 ± 3.36 months and there was no significant difference among them and the farm sizes ($p > 0.05$).

Non productive milking cows

Sizeable quantity of heifers were categorized as non fertile animal because, they were not become pregnancy after doing 4th AI or yet. Dairy village have high percentage of non productive animals than non-dairy village (Figure 1). Medium scale farm category reported low number of non productive animals and high account were reported in large scale farm category in two village categories. However, most of mulches became non fertile after 5th calving. In that period they passed their economical production. But managed reproduction plan have been needed for improve the heifers of the herds.

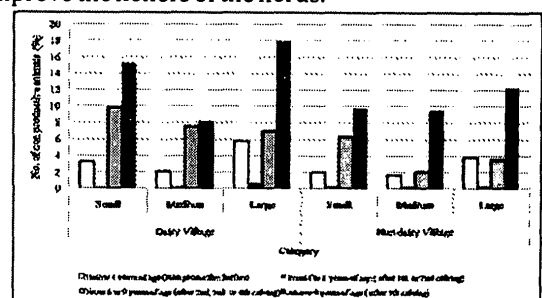


Figure 1: Effect of farm and village categories on Non-productive (non-fertile) Animals in the Herd (%)

Table 1: Effect of farm and village categories on breeds and production characteristics of dairy cattle

	Dairy village			Non-dairy village		
	Small	Medium	Large	Small	Medium	Large
Breed distribution (%)						
Friesian graded	34.5	46	29.2	35.5	55.4	40
Jersey graded	65.5	42.8	49.4	42	39	51.2
Ayetshire graded	0	10.7	3.9	22.5	5.4	2.4
Other	0	0.5	16.8	0	0.2	6.4
Productive performance						
Average milk Production (morning & evening milking) (l/day/cow)	8.52 ^a ± 1.9	7.39 ^b ± 1.9	7.16 ^b ± 1.53	8.48 ^a ± 3.59	8.71 ^a ± 2.44	7.19 ^b ± 2.1
Average milk Production (morning milking only) (l/day/cow)	8.12 ± 0.9 ^a	7.2 ± 1.0 ^b	6.96 ± 0.53 ^b	8.18 ± 0.59 ^a	8.01 ± 0.44 ^a	6.29 ± 1.1 ^b
Total milk Production (morning & evening milking) (l/day/cow)	2250 ^a ± 578 ^a	2248 ± 571 ^a	1952 ± 437 ^b	2494.0 ± 532 ^a	2608.8 ± 815 ^a	1966 ± 300 ^b
Total milk Production (morning milking only) (l/day/cow)	2418 ^a ± 243 ^a	2131 ± 129 ^b	1910 ± 146 ^b	2395.1 ± 173 ^a	2496.71 ± 137 ^a	1887 ± 330 ^b
Peak milk Production (morning & evening milking only) (l/day/cow)	11.17 ± 0.78 ^a	9.44 ^b ± 1.2 ^b	9.35 ± 1.0 ^b	11.66 ± 1.5 ^a	12.08 ± 2.01 ^a	10.02 ± 2.2 ^b
Length of lactation (months)	9.93 ± 0.37 ^a	9.87 ± 0.43 ^a	9.15 ± 0.93 ^b	9.76 ± 0.57 ^a	10.39 ± 0.8 ^a	9.51 ± 0.74 ^b
Calving Interval (months)	13.44 ± 1 ^b	14.6 ± 1.86 ^b	14.15 ± 1.06 ^b	15.63 ± 2.85 ^a	15.3 ± 1.8 ^a	15.75 ± 1.13 ^a
No. of Insemination per conception	2.05 ± 0.53 ^b	2.05 ± 0.67 ^b	2.09 ± 0.59 ^b	2.78 ± 0.89 ^a	2.52 ± 1.27 ^a	2.49 ± 0.78 ^a

Means with the same letter is not significantly different (p>0.05).

Productive and fertility performance Milk Production

Most of the farmers in Dairy village milked their animals twice a day (morning and evening) and rest was done only morning milking. But, most of the farmers in non-dairy village did morning milking only. The reason may be a large number of farmers in non-dairy village have other sources of income rather than dairy. However, there was no significant difference between average milk production in dairy village and non-dairy village in case of morning milking as well as twice a day milking ($p > 0.05$). The average milk production under twice a day milking was 8.12 ± 0.78 l/day/cow and 7.92 ± 0.45 l/day/cow in morning milking for the studied area. There was no significant difference between average milk production of twice a day milking and morning milking ($P > 0.05$).

There was a significant difference in average production among farm categories. The medium non-dairy village farms reported significantly higher milk production than medium dairy village farms ($p < 0.05$). Therefore high milk yield of medium Non-dairy farmer might be due to good management or difference in breeds or differences in time and length of lactation. The published information on production parameters of dairy cows in up country dry zone is somewhat scanty. However, according to *Bandara et al.* (2011) milk production under semi-intensive system in Welimada area was reported as 4.9l/day/cow which is lower than the present data.

The peak milk production (recorded only for twice a day milking) in dairy village (9.99 ± 0.23) was significantly lower than that in non-dairy village (11.332 ± 1.01). Poor improvement of production in dairy village was due to un-proper selection of area for dairy village or may be management failures. However, they should be studied separately.

Length of lactation Length of lactation (Table 1) was higher in medium farm category than in small and large farm categories but, there is no significant difference ($p > 0.05$). Consequently large scale farms reported significantly lowest length of lactation ($p < 0.05$). Length of lactation was not significantly different between two villages ($p > 0.05$) and that was around 10 months. That length of lactation is considered as the ideal period of lactation in economic milk production. Welimada dairy division practiced that economic milk production.

Calving Interval and Number of insemination per conception

Calving interval was significantly lower in dairy village than in non-dairy village ($p < 0.05$). Dairy village stock-keepers' achieved low calving interval around 14 months. Calving interval was not significantly deviate among farm levels ($p > 0.05$). Number of inseminations per conception was significantly lower in dairy village than in non-dairy village ($p < 0.05$).

According to Roberts (1986), calving interval of a well-managed dairy herd should be between 12-13 months for European condition, whereas De Silva and Sathasivampillai (1975) reported a value of 16-17 months for cows in up-country, Sri Lanka, irrespective of the breed. The national level of Calving interval of cows in Sri Lanka has been reported to be 464 days (15.5 months) by Herath and Balachandran (1993). Theoretical expectation is one calf per year and around ten months of lactation length, but, this is rarely achieved under the tropical condition. However, according to the present result reproductive management was well carried out in dairy village. Farmer training classes were conducted in dairy village through veterinary office, to make aware of AI procedure, proper age of service and how to care

animal after insemination etc. Those are directly related to the reduction of calving interval and no. of inseminations per conception in dairy village. In order to accomplish this, awareness is necessary for the non-dairy village.

Result reviewed that dairy village has not increased the average milk production than other villages but, reproduction management of former was better. Therefore, better dairy development programs need to be introduced to increase the milk production.

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