

Animal Hygiene and Farm Management in Dairy Production Systems in Developing Countries: A Case Study in Sri Lanka

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I . Introduction

The livestock sector plays a vital role in the Sri Lankan economy. It significantly contributes to the economic development via alleviating poverty and nutritional deficiency, improving regional growth and disparities in the country profile; and for involving a greater proportion of women in the economic development in the economic development process.

The dairy sector can achieve sustainable production by integrating crops with livestock. The main problems in the milk production system include the lack of profitability, absence of proper technology, inefficiency of extension service, high cost of production are the main problems in the milk production system. The main objectives of the study are to estimate the basic factors affecting on small scale dairy farm income and special focusing on animal hygiene and feed management in Sri Lanka.

II . Research Methodology

The six sample of the research study is based on the Intensive (cut and fed in a shed), Extensive (free grazing, often no housing) and Semi-intensive rearing systems (mixed of Intensive and Semi intensive system). The regular weekly data were collected between January 1 and December 31, 2009 on Socio-economic aspects of the dairy farmers, Herd characteristics, Feeding practices and expenditure, Animal health and milk hygiene, Inventory changes related to dairy, Milk production and marketing, Land utilization, Labor utilization and Veterinary and Extension services.

III. Trends in Livestock Production in Sri Lanka

The milk production from cows and buffaloes has expanded dramatically from 179.89 ('000 metric tones) in 1999 to 202.01('000 metric tones) in 2007. During the same period cow milk production has increased from 149.68 ('000 metric tones) to 169.72 ('000 metric tones) and buffalo milk from 30.19 ('000 metric tones) to 32.28 ('000 metric tones) mainly due to genetically modified disease resistant upgraded animals. However, the high prices on animal feed have reduced the rate of milk production during the last few years. The demand for the local milk production has increased and thereby reducing the imports, which is approximately one fifth of the total import bill on food commodities (Figure 1).

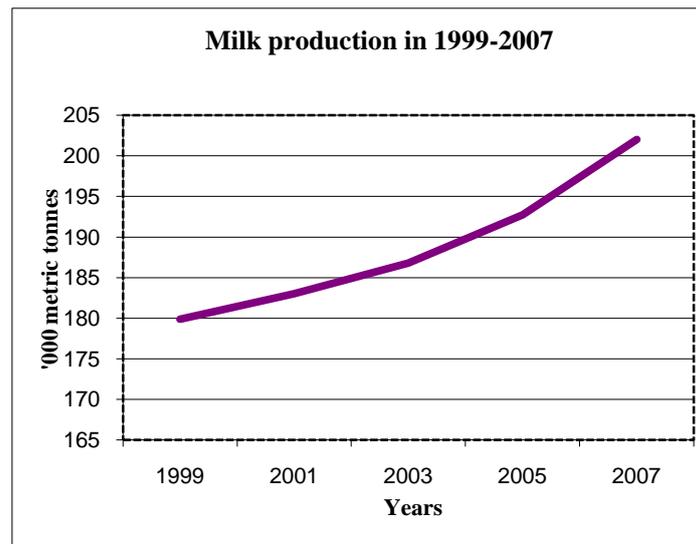


Figure 1: Milk production in 1999-2007

Source: Sri Lanka Livestock Statistics, Ministry of Agriculture, 2008

IV. Results and Discussion

The lactation length of animals in the study sample depends mostly on the management objective of the farmer, may prolong the lactation length for the sake of continues milk production or dry off the animal at early stage for the purpose of breeding the cow. As indicated in the table 3 the average lactation length for cows of farm A and B were 323.7 days and 255.0 days respectively, but it was heavily depends on the individual animal performance and the stage of the lactation of other animals. In order to maintain income throughout the years operator of farm maintain the lactation length. Low milk producing animals dry off quickly compared to the lower performing low milk producing animals. On contrast lower lactation length can be observed in the farm A, that is mainly due to poor health conditions of the animals. There for it is very important to understand the underlying factors for variation in lactation length (Table 1).

Table 1: Reproductive performance indifferent management systems of six farmers

Variable	A Intensive	B Intensive	C Semi-intensive	D Semi-intensive	E Semi-intensive	F Extensive
Age at first calving (months)	19.0	25.4	29.5	28.0	26.2	31.6
Days open	120.6	90.2	213.5	180.0	228.0	307.0
Number of services per conception	1.4	1.1	3.2	3.0	1.5	1.6
Calving interval(days)	395.2	337.0	488.0	450.0	455.0	547.5
Lactation length(days)	323.7	255.0	383.3	475.0	240.0	590.0
Infertility Economic loss (Rs.)	5871.36	222.82	18279.20	7605.00	17564.80	20710.90

Table 2: Description of the variables used in the technical efficiency model

Y	Technical efficiency (Value of the income from milk sales per farm (Rs) over cost on feed, veterinary and labor (Rs))
X ₁	Income from milk sales/animal/month (‘000 rupees)
X ₂	(Cost on feeds/animal/month) ² (‘000 rupees)
X ₃	Coconut poonac usage/animal/month (kilograms)
X ₄	Management system (Intensive = 1, others =0)
X ₅	Season of the year (Dry season =1, wet season =0)
X ₆	Experience of the farmer (years)
X ₇	Mastitis out break (Yes=1, No=0)
X ₈	Average parity of the farm
X ₉	Coconut poonac usage and mastitis out break interaction term

We calculated regression model to estimate the factors to determine the technical efficiency (Value of the income from milk sales per farm (Rs) over cost on feed, veterinary and labor (Rs)) (Table 2, 3). Squared value of the feed cost showed negative value with technical efficiency and was found highly significant. The behavior of this variable may due to decreasing technical efficiency attributed to feed over utilization. Similarly, the estimated coefficient for coconut poonac used have negative significant relationship indicated the low productivity of coconut poonac feeding animals. Further, Technical efficiency in the intensively managed farms showed negative coefficient it may due to heat stress in the dry zone which negatively effect on Fresian animals and intensive usage of high priced manufactured feeds by intensive farmers.

Table 3: The coefficient of the estimated technical efficiency regression model

Variables	Coefficients	Standard error	Probability level
Constant	-11.42	2.286	0.0000*
X ₁	0.29	0.025	0.0000*
X ₂	-0.06	0.012	0.0000*
X ₃	-0.01	0.003	0.0056*
X ₄	-7.27	1.084	0.0000*
X ₅	0.28	0.061	0.0000*
X ₆	0.29	0.032	0.0000*
X ₇	-3.77	0.940	0.0002*
X ₈	4.55	0.934	0.0000*
X ₉	-0.37	0.258	0.1537 ^{NS}
Adjusted R ²	0.88		

NS – Not significant, * - Significant (P<0.01)

Sri Lanka has the potential to increase the milk production and the income level of the small scale dairy farmer. Results of the present study revealed that some farmers operate at the low technical efficiency, by using high costly manufactured feeds to European breeds. Hence researcher should be encouraged to develop low cost high effective feed ration. Most of the animals are at the initial stage of the lactation during the dry season where there are low pastures; hence farmer awareness program should be conducted to restructure the stage of the calving and the pasture available season.