

NUTRIENT STATUS OF DAIRY BASED VEGETABLE PRODUCTION SYSTEMS  
IN THE UPCOUNTRY VILLAGE SECTOR OF SRI LANKA

By

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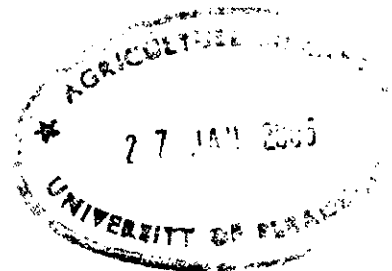
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## ABSTRACT

High potential arable land in the upcountry of Sri Lanka provides sustenance to many households cultivating vegetables. Due to land scarcity soils are now subject to continuous and intensive cultivation. Two types of survey, namely general and in-depth were carried out in 2000 to 2003 in village based dairy- vegetable system in Nuwera Eliya. The objectives of these studies were to understand nutrient balance and pattern of nutrient flows of the system, to identify the present status of manure management and to investigate the socio-economic status of the farmers. General survey included sixty dairy-vegetable farmers and for in-depth survey the number of farms selected was fifteen. Farms were visited once for the general survey and recalled data of the previous year was collected. For the in-depth survey, farms were visited once a month throughout the study period. Data for both types of surveys were collected using pre-tested questionnaires. In addition, samples of fodder, compost and fresh dung were collected in each visit. Samples were dried in an oven at 60°C for 48 hrs and ground to pass through a 2mm sieve. All Samples were analyzed for Nitrogen (N), Phosphorous (P), Potassium (K) and organic carbon. Data were entered in Excel computer package and analyzed by SAS computer package.

In both surveys, farms were categorized according to land size as small, medium and large scale farms. Findings from general survey revealed that livestock acted as a major source of exogenous nutrient inputs to the farming system and livestock herd size ( $2.42 \pm 1.43$  Total Livestock Unit) was largely independent to farm size. Manure was used within the farm and milk was sold outside ( $13.85 \pm 2.32$  l/household/day) with little retained for

home consumption ( $1.2 \pm 0.02$  l/household /day). Average milk yield of dairy animal was  $7.30 \pm 2.77$  l/animal/day and Nestle was the main collector operating actively in this area (86.5% of farmers sell milk to them). Overall results of this survey revealed high concentrate price and the low milk price were the two major constraints for dairying in this area.

The nutrients balances of the farms obtained by general survey were highly positive for all three nutrients (N, P and K). Small farms showed significantly higher ( $P < 0.05$ ) balances of nutrients (N-1.2, P-0.2 and K-0.28 kg/m<sup>2</sup>/yr) than medium and large scale farms. High livestock density, high intensity of cultivation and high input usage were the main reasons for this. Organic manure application had a positive relationship with nutrient balances. In addition, livestock density versus nutrient balance also showed a positive relationship. Analysis between farms, with and without animals revealed significantly ( $P < 0.05$ ) high nutrient (N, P and K) balances in farms with animals.

In the in-depth survey the mean herd size was  $2.70 \pm 1.37$  total livestock units and the average milk production was  $9.24 \pm 2.96$  l/day/cow and the home consumption was  $1.32 \pm 0.7$  l/day/household. Even though N and P balances per unit area were high in small farms, only N balance was significantly ( $P < 0.05$ ) high. Land area versus nutrient balance showed a negative relationship and livestock density versus nutrient balances showed a positive relationship.

Integrated cattle farming in vegetable based system is profitable in terms of milk revenue and internal use of manure for vegetable production, which reduces the cost of production of vegetables. Therefore on the long term cattle farming in upcountry wet zone is economically viable in vegetable based system. But high positive balances of the major nutrients (N, P and K) are a threat to the long term sustainability of this system.