

SMALLHOLDER DAIRY IN UTTARANCHAL MOUNTAINS: PERFORMANCE INDICATORS

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INTRODUCTION

Dairy farming is an integral part of mountain agriculture. Smallholders comprising majority of mountain farmers are accustomed to rear some animals as an essential component of the farming system. Among the various basic needs the animals fulfill, milk is the most important for a family. Dairy animals are the best means to convert local vegetative biomass into useful products and work, and the high value biodiversity into the products of still higher value, such as dairy products fondly consumed by masses. That is why the dairy animals have been occupying predominant place in the herd in mountain region.

A dairy farm, to be economically successful, must look into some of the basic indicators. These indicators further guide a dairy farmer to take remedial steps towards improving the situation of her/ his dairy unit. This paper attempts to highlight performance indicators relating to the smallholder dairy farms dominating the mountain areas.

Ages at first calving, lactation length, lactation yield, calving interval, service period, etc. are the important traits associated with dairy animals that are vital for the economic sustainability of a dairy farm. Reduction in the age at first calving and dry period leads to an increase in lactation yield and productive life of the dairy animals and economy of a dairy farm.

MATERIALS AND METHODS

This study was conducted in the two districts of Almora and Nainital in Kumaon area of Uttaranchal. In each district, two Community Development Blocks (CDBs) and in each CDB three villages, i.e. in total 12 villages were selected purposely for the study. The village selection criteria were based on location and organisation. Three locations varied according to altitude from mean sea level. One of the selected villages in each CDB was in the valley (lowland) area and, in terms of cropping practices, it was largely a transformed village. The other village was in Mid-altitude upland (sloping agriculture) area witnessing traditional agricultural practices on larger scale. The other was on high altitude upland area, representing dominant traditional area with strong linkages with forest ecosystems. One of the three villages selected, irrespective of its location or agricultural system, represented a milk society or Village Dairy Cooperative (VDC). Four villages, out of 12, were purposely selected near urban area. These selection criteria were in tune with the various variables operating in a mountain farming system that would influence the performance of a smallholder dairy farm.

Selection of smallholder dairy farms was based on the criteria used earlier in the specific context of the region under study by Singh (1998). Twenty percent of the selected smallholder dairy farms were surveyed to collect intended information.

RESULTS AND DISCUSSION

Information on the performance indicators presented in Table 1 shows that figures for cows are not much satisfactory; for buffaloes, they are reasonably good. Poor performance of cows is a reflection of undernutrition, particularly during lean period. Buffaloes are better fed, for they are especially reared for milk sale. Long dry periods for cows are also a reflection of short lactation period (eight months).

Table 1: Some Performance Indicators relating to the Dairy Animals in UP Hills

| <i>Indicators</i> | <i>Dairy Animal</i> | |
|--|---------------------|--------------------|
| | <i>Cow</i> | <i>Buffalo</i> |
| Age at first calving, years ¹ | 4 (3.6-4.5) | 5 (4.5-5.5) |
| Calving Rate, % per year ² | 57 (55-60) | 63 (58-68) |
| Calving Interval, months ³ | 16 (15-17) | 15 (14-16) |
| Number of calvings in life time ⁴ | 6.5 (5-8) | 9 (7-11) |
| Lactation Length, months ⁵ | 8 (7-9) | 11 (10-12) |
| Lactation Yield, litres ⁶ | 552 (483-621) | 1224.5 (1113-1336) |
| Average milk yield, litres per head per day ⁷ | | |
| Valley | 2.30 | 3.50 |

| | | |
|-------------------------------------|-------------|-------------|
| Mid-altitude Upland | 2.10 | 3.00 |
| High Altitude Upland | 2.00 | 2.50 |
| Near Market Area | 2.50 | 4.00 |
| VDC | 2.60 | 5.55 |
| Average | 2.30 | 3.71 |
| Dry Period, months ⁸ | 8 | 4 |
| Service Period, months ⁹ | 7 | 5 |
| Adult body weight, kg ¹⁰ | 209 | 398 |
| Mortality, percent ¹¹ | | |
| In calves | | |
| Male | 12 | 92 |
| Female | 16 | 12 |
| In adults | 8 | 4 |

Figures in parentheses reflect range.

¹ Age at first calving is the age of the mature dairy animal when it calves for the first time.

² Calving Rate = (Number of calves born per year / Number of adult females in the population) x 100.

³ Calving Interval is the time between two successive calvings; Calving Interval = (1/ Calving Rate) x 12.

⁴ Number of calvings in lifetime = (Productive life / Calving Interval) x 12.

⁵ Lactation Length = (Calving interval x percentage of animals in milk) / 100;

Percentage of animals in milk = (Average No. of animals in milk / Total No. of milch animals) x 100.

⁶ Lactation Yield, litres = (Milk produced by dairy animals/ No. of dairy animals) x (Calving Interval/ 12).

⁷ Average milk yield per head per day = Total milk produced by all animals in milk/ Total animals in milk.

⁸ Dry Period = (Dry Period, months) – (Lactation Length, months).

⁹ Service Period is the time between calving and becoming pregnant again;

Service Period, months = (Calving Interval) – (Gestation Period);

Gestation periods for cows and buffaloes are 9 and 10 months, respectively.

¹⁰ Weight of animal is calculated from body measurements of 16 adult cows and 10 buffaloes by the following formula (Anonymous 1982; Singh 1998):

$$\text{Body Weight, kg} = (L \times G^2) / 10317;$$

Where, L = Length from point of shoulder to pin bone in cm; and

G = Circumference of animal immediately behind the front legs in cm.

¹¹ Mortality, %: For calves = (No. of calves died during the year/ No. of calves born during the year) x 100;

For adults = (No. of adults died during the year / No. of adults in the population) x 100.

Shortage of bulls is another important cause of long dry periods in cows in the area. Most of the villages in Uttaranchal Hills do not have a bull. Some time two or even more villages would share a single bull. Many heat periods are undoubtedly lost because the cows cannot be taken to a bull, at least in time. Artificial Insemination (AI) Centres are few and most of the dairy farmers have no access to them. The experiences of the dairy farmers with AI Centres, on the whole, are bad. Our respondents, who have easy access to the AI Centres, would complain of the poor conception rate of the AI.

The situation with respect to breeding buffalo bulls is much better without any institutional programme of any sort. Most of the villages will have at least one buffalo breeding bull. One reason of it is that services by a buffalo bull fetch handsome returns to the family owning bull. Per service charges (on the confirmation of conception) are Rs 150. Services of a cow bull were free of cost till recently and it was customarily treated as a social service. The cow bull owners, nevertheless, have now begun to charge against rendering bull services (Rs 100 per service after the confirmation, and occasionally more).

Mortality rate in case of buffalo male calves are incredibly high (92 percent). In fact, this is a deliberate attempt of the farmers. Male buffalo calves have no value (e.g., as draught or meat animal) in the farming system in Uttaranchal Hills. They are, therefore, starved to death few days after their birth. Buffalo, unlike a cow, thus, is maintained purely for milk production purpose.

Whereas most of the performance indicators are the same for all locations, dairy animals in VDCs would show some better performance. Average milk yield of dairy animals is the highest in VDCs, followed by the animals in the villages located near market areas. It is mainly due to better feeding and care of dairy animals at the farms having close linkages with the market.

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