Cost of Milk Production in relation to herd strength

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Abstract

The yearwise data of total herd strength (HS), number of milch animals (MA), number of dry animals (DA), young stock (YS), cost of feed per animal (CF/A), cost of labour or labour charges per animal (LBCH/A), cost of medicine per animal (Med./A) and cost of miscellaneous items per animal (Misc./A) categorized into two groups : Group A and Group B. The observations with herd strength above 200 and below 200 were placed in Group A and Group B, respectively. The years categorized under Group A were 1989-90 to 1994-95 and 1997-98 while those under group B were 1995-96, 1996-97 and 1998-99. Lactation Efficiency (LE) has parallel relationship with number of milch animals on the farm. Total herd strength had highly significant ($P<0.01$) negative correlation with all the cost parameters except FC/A and Med./A. FC/A and LBCH/A were lower and milk yield (MYHB and MYWB) was higher in group A than in group B indicates that higher herd strength group is more beneficial to maintain and manage at organized dairy farm than the lower herd strength group.

Keywords: Milk Production, Herd strength, Cost, Lactation Efficiency, Milch animals

Introduction

The bovine livestock forms the third largest resource of India's economic base after land and irrigation. India has made remarkable strides in the arena of dairy development. Milk production in India is reported to be steadily increasing. It was 17.4 million tonnes (MT) in 1950-51 reaching 74.3 MT during the year 1997 (Anon., 1997). However, this development is considered insignificant when viewed against the huge cattle and buffalo population in the country, ver low productivity of our milch animals and inability of large segment of population to afford to consume milk.

The present economic condition demands that the dairy animals should not only be high producers but should be profitable, too. The economics of dairy cattle production and ultimately dairy development depend not only on the level of milk production but also on the other factors, viz. herd size, labour utilization, lactation efficiency, reproduction, breeding, growth, stayability, etc. and profitability of dairy units which is the prime objective in any business enterprise. The present research work was undertaken at Livestock Instructional Farm, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola to assess milk production trends in relation to herd strength, to assess optimum size of herd for maximum profit per unit animal, cost of milk production and effect of various factors of cost on the total cost of milk production.

Material and Methods

The present work was undertaken at the Livestock Instructional Farm (LIF), Dr. Panjabrao Deshmukh Krishi Vidyapeeth (Dr. PDKV), Akola (MS). Akola is located in subtropical region having extreme climatic conditions situated at a latitude of 19.21°North, longitude of 76.38°East and at an altitude of 303 meters above mean sea level. Minimum temperature in winter is 10°C and the maximum temperature is 48°C in summer with an average 165.5 mm rainfall.

To study the milk production trends at organized crossbred cattle and buffalo dairy herds, yearwise data of the ten financial years from 1989-90 to 1998-99 related with herd strength, milk yield, lactational efficiency, milk production trends and various expenses incurred upon dairy herds for their management collected from the records maintained at Livestock Instructional Farm (LIF), Dr. Panjabrao Deshmukh Krishi Vidyapeeth (Dr. PDKV), Akola.

The yearwise data of total herd strength (HS), number of milch animals (MA), number of dry animals (DA), young stock (YS), cost of feed per animal (CF/A), cost of labour or labour charges per

animal (LBCH/A), cost of medicine per animal (Med./A) and cost of miscellaneous items per animal (Misc./A) categorized into two groups : Group A and Group B. The observations with herd strength above 200 and below 200 were placed in Group A and Group B, respectively. The years categorized under Group A were 1989-90 to 1994-95 and 1997-98 while those under group B were 1995-96, 1996-97 and 1998-99.

Lactational efficiency (LE) was calculated yearwise according to the formula used by Pandey et al. (1991).

$$LE\ \% = \frac{\text{No. of milch animals per year}}{\text{Total No. of milch and dry female and made adults animals per year}} \times 100$$

Milk yield on herd basis (MYHB) calculated as -

$$MYHB = \frac{\text{Total annual herd milk production}}{\text{Average annual herd strength}} \times 100$$

Milk yield on wet basis (MYWB) calculated as -

$$MYWB = \frac{\text{Total annual herd milk production}}{\text{Average No. of milch animals per year}} \times 100$$

The fixed cost per animal per day (FC/A) was assumed as 15 per cent of the total cost of milk production (Shah and Sharma, 1994; Sharma and Singh, 1994 and Kalara et al., 1995). Total variable cost per animal per day (TVC/A) which is comprised of the sum of feed cost (CF/A), labour charges (LBCH/A), medicinal expenditure (Med./A) and miscellaneous cost (Misc./A) calculated using various formulae.

Total cost of milk production (FC + TVC) per animal per day on herd basis (TC/A-Herd) was calculated using the following formula.

$$\text{TC/A-Herd (per day)} = \frac{\text{Total cost of milk production/year}}{\text{Average annual herd strength} \times 365}$$

Results and Discussion

The mean herd strength (HS) irrespective of years for the Group A and Group B found to be 245.28 ± 7.62 and 165.33 ± 23.91, respectively with mean herd strength during the experiment period was 221.30 ± 14.66. Mean percentage of number of milch animals in the group A, B and pooled population were found to be 21.72, 21.55 and 21.67 per cent, respectively. Percentage of dry animals in Group B is found to be higher (31.5%) than that in Group A (28.15%) with pooled percentage of dry animals as 29.16 per cent.

It is seen that young stock constituted about half of the livestock population on the farm. Significant ($P < 0.01$) difference was found between the mean young stock percentage of the groups (i.e. A and B). Findings were in agreement with Pandey et al. (1991) who reported 51.1 per cent young stock over total herd strength.

Lactational efficiency (LE) showed parallel relationship with number of milch animals. The LE found to be nearly similar in both the herd strength groups. MYHB in group A was higher than in group B, but this difference was statistically non significant. The average MYHB in the decade was found to be 373.90 ± 39.32 lit/animal/year while that on wet basis (MYWB) in the decade was found to be 1735.70 ± 196.38 lit/animal/year. Average MYWB in group A was much higher than that in the group B. However, this difference in milk production between two herd strength groups was statistically non significant,. Average milk yield at LIF was comparable with those reported by Rekib et al. (1987) and Siwach et al. (1992) who reported annual milk yield in the order of 1300-1500 litres and 1653.3 litres. respectively.

In the present study it was assumed that the share of fixed cost (FC/A) was about 15 per cent of the total cost as per Kalra et al. (1995), Shah and Sharma (1994) and Sharma and Singh (1994). It is seen in Table 2 that, CF/A was higher in Group B than in Group A; however, this difference was statistically non significant proportion of feed cost

Table 1. Mean and SE of herd strength groups A and B and pooled mean and SE of total herd strength during the years 1989-90 to 1998-99

Year group	HS	MA (%)	DA (%)	YS (%)	LE (%)	MYHB (in litres)	MYWB (in litres)
Group A							
Mean A	245.28	21.72	28.15	50.19	43.61	408.57	1912.71
SE	7.62	3.76	2.57	5.48	2.36	39.69	224.62
Group B							
Mean B	165.33	21.55	31.5	46.94	40.39	293	1316
SE	23.91	9.24	5.36	11.04	3.89	86.56	309.14
Pooled mean	221.30	21.67	29.16	49.21	42.65	373.90	1735.70
SE	14.66	4.34	3.46	12.43	1.96	39.32	196.38

was 34.43 per cent tot the total cost and 40.51 per cent to the total variable cost (TVC). Cost of feed at LIF, Akola is much lower than that reported by Singh and Gangwar (1985), Kalyankar (1980), Rao and Singh (1980) and Kalra et al. (1995). They reported feed cost in the order of more than 50 per cent of total cost.

LBCH/A were significantly (P<0.01) higher in Group B than in Group A indicates that labour charges decreased with increase in number of animals. The proportion of labour charges to the total cost was 35.86 and 42.19 per cent to the total variable cost (TVC). Cost of medicine per animal per day (Med./A) at the farm occupied comparatively very small portion of the total cost (2.07 per cent) and total variable cost (2.44%). During the ten years, it remained fairly constant. Medicinal cost was higher in Group A than in Group B however no significant difference was found between the medicinal cost of two groups. Similar findings were also reported by Pandey et al. (1991) and Bardoloi et al. (1999).

Miscellaneous cost (Misc./A), the third major portion of TVC (15.00% of TVC) and total cost (12.625), did not show definite trend, yearwise. Also no significant difference was found between the miscellaneous cost of two herd strength groups.

Total cost of milk production per animal per day on herd basis (TC/A-Herd) (the sum of FC and TVC) increased yearwise. It was higher in Group B than in Group A. Highly significant difference (P < 0.01) was observed between the total costs of two herd strength groups. Findings are in agreement with Dayakar Rao et al. (1991).

Total herd strength had highly significant (P<0.01) negative correlation with all the cost parameters except FC/A and Med./A. Findings of correlation herd strength with FC/A and TVC are in agreement with Balwinder Singh (1980). Correlation of herd strength with labour charges are in agreement with Shiyani et al. (1995). Findings on correlation of herd strength with total cost per animal are in agreement with Dayakar Rao et al. (1991).

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