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Comparative Studies on Cost of Milk Production of Cross-bred Cows and Murrah Buffaloes in Different Holding Size Groups

Bhimsen, S.S. Katiyar[1], Om Prakash[2] and N.K. Singh[3]
Deptt. of A.H. & Dairying, R.B.S. College, Bichpuri, Agra
E-mail : bhimsen303@gmail.com
1. R.S.M. (P.G.) College Dhampur Bijnor (U.P.)
2. Amar Singh (P.G.) College, Lakhaoti Bulandhshahar (U.P.)
3. B.N.V. Degree College, Rath Hamirpur (U.P.)

Abstract

An investigation was investigated in Achhnera block of Agra district entitled "Comparative Studies on cost of milk production of cross-bred cows and murrah buffaloes in different holding size groups viz. Ist (Landless), IInd (Marginal), IIIrd (Small), IVth (Medium) and Vth (Large) was carried out and found that the overall average per lactation milk yield of cross-bred cows (2504.22 ± 28.10 lit.) was significantly (P ≤ 0.01) higher than that of murrah buffaloes (2068.27± 31.70 Lit.). The greater milk production was found in large holding size groups of both ruminants. The overall average cost of milk production/Lit. of cross-bred cow was significantly (P ≤ 0.01) lower (Rs. 20.11 ± 0.15) than that of murrah buffaloes (Rs. 29.06 ± 0.28). This was due to higher milk yield and lower net maintenance cost of cross-bred cows than murrah buffaloes. The cost of milk production per litre was significantly (P ≤ 0.01) decrease with increase in holding size groups in both species of ruminants. The average input-out ratio was significantly (P ≤ 0.01) greater in cross-bred cows (1 : 1.50 ± 0.02) than that of murrah buffaloes (1 : 1.31 ± 0.03) ; the investigation revealed that the milk production, and input-output ratio was greater in large holding size groups in both ruminants while cost of milk production per litre was lowest which indicated that maintenance of cross-bred cows and large holdings was more economic than that of murrah buffaloes.

***Key words** : Buffalo, cow, Holding size, cost of milk production, input-output ratio, milk yield.*

Introduction

Dairying in India is by large in the hand of small/marginal land holders and agricultural labours. Eighty percent of 97.7 million farm families in India possess cattle and/or buffaloes that have neither the knowledge nor the appreciation of the concept of cost of production. So as to assess the viability of such an activity. The economics of milk production could be envisaged through two angles, viz. decreasing the unit cost of milk production and increasing the milk productivity of milch animals. Any attempt to achieve these objectives will encourage the producer to produce more milk by mobilization of the available resources. Indian dairying has made as remarkable progress in our country despite a large influx in human population. The total milk production per milch animal in a lactation depends on the daily milk producing efficiency of the animal, duration in milk, herd size of animals, holding size of families, species and breeds of the animals and its level of feeding[3,4].

The role of dairying in augmenting income of rural households through increased milk production. The present investigation was undertaken to assess the comparative studies on cost of milk production of cross bred cows and murrah buffaloes in different holding size groups.

Materials and Methods

The present study was carried out in five village of Achhnera Block of Agra. After selection of villages, a list of families have different holdings as I (Landless), II (marginal), III (small), IV(medium) and V (Large holding) and

having crossbred cows and murrah buffaloes was prepared. In all, 45 dairy farms were selected for this study. There were a total of 140 animals, out of which 73 were cross-bred cows and 67 murrah buffaloes which belonged to different holding size groups. Holding size groups was divided into 5 groups maintained in each groups as delineated below.

Ist Landless (having no land)
IInd Marginal (having 0 – 1.0 acre)
IIIrd Small (having 1.1 – 2.0 acre)
IVth Medium (having 2.1 – 3.0 acre)
Vth Large (having above 3.00 acre)

Detailed information from each selected milk producers regarding fixed capital investment, animal cost, feed cost per animal/lactation, feed given to milch animal, labour and other charges, miscellaneous charges, milk yield per lactation per animal and sale price of milk per litre were collected through the records maintained by producers and personal interview. The maintenance cost was calculated by adding fixed and variable cost per milch animals incurred in different holding size groups. The net maintenance cost was the calculated by subtracting the dung value from the maintenance cost. The cost of milk production per litre of milk was estimated by dividing the net maintenance cost by the total milk production. The input-output ratio was calculated by dividing value of milk by the net maintenance cost. The data related to year 2019-20.

Results and Discussion

The table 1 show that the milk production per lactation in different holding size groups of crossbred cows and murrah buffaloes viz; Ist, IInd, IIrd, IVth and Vth were found to be

Table 1 Milk production (litre) per lactation in different holding size groups

Holding Size	Milk Production/lactation (Lit.)		Test of significance
	Cross-bred cows	Murrah buffaloes	
(A) Milk Production / Lactation			
Landless	2382 ± 22.6 (16)	1923 ± 31.6 (11)	6.316^{++}
Marginal	2426 ± 24.1 (11)	2006 ± 28.4 (9)	14.123^{++}
Small	2508 ± 26.7 (18)	2067 ± 36.7 (17)	11.641^{++}
Medium	2576 ± 29.9 (19)	2118 ± 34.2 (22)	9.364^{++}
Large	2658 ± 32.4 (9)	2204 ± 32.7 (08)	12.517^{++}
Overall	2504.22 ± 28.1 (73)	2068.27 ± 31.7 (67)	9.863^{++}
(B) Value of Milk / Lactation			
Landless	71460 ± 63.46 (16)	73074 ± 56.14 (11)	7.96^{++}
Marginal	72780 ± 68.13 (11)	76228 ± 51.96 (9)	8.91^{++}
Small	75240 ± 59.96 (18)	78546 ± 63.49 (17)	11.24^{++}
Medium	77280 ± 71.08 (19)	80484 ± 81.46 (22)	10.04^{++}
Large	79740 ± 79.27 (9)	83752 ± 76.34 (08)	14.38^{++}
Overall	75126.60 ± 68.16 (73)	78594.26 ± 67.1 (67)	10.634^{++}

Note: Figure in parenthesis indicate number of animals

++ = Significant P ≤ 0.01.

2382 ± 22.6 and 1923 ± 31.6, 2426 ± 24.1 and 2006 ± 28.4, 2508 ± 26.7 and 2067 ± 36.7, 2576 ± 29.9 and 2118 ± 34.2 and 2658 ± 32.4 litre and 2204 ± 32.7 litre, respectively. These results indicated that the crossbred cows give significantly ($P \leq 0.01$) higher milk production than that of murrah buffaloes in all five holding size groups. The table further showed that the milk production increase with increase in holding size in both remunants. It is expected that more feeds and fodders should be more available to the animals with concomnitant increase in milk production. It is thus clear that landless labour and farmer's with small area of land viz. marginal and small pay more heed to their animals than those having large area of land. The table 1 further revealed that the value of milk per lactation per animals of cross-bred cows and murrah buffaloes in above five holding size groups find to be Rs. 71460± 63.46 and 73074 ± 56.14, 72780 ± 68.13 and 76228 ± 51.96, 75240 ± 59.96 and 78546 ± 63.49, 77280 ± 71.08 and 80484 ± 81.46 and 79740± 79.27 and 83752 ± 76.34, respectively. The value of milk have similar effort as milk production performance in both species of ruminants in all above holding size groups.

The data presented in table 2 revealed that the maintenance cost of cross-bred cows and murrah buffaloes per lactation per animal in different holding size groups as I^{st}, II^{nd}, III^{rd}, IV^{th} and V^{th} were found to be Rs. 55802.12±428 and 63329.78±506, 52732.48±396 and 64276.24±481, 53193.76±449 and 64357.72±476, 53092.64±461 and 63958.14±517 and 52443.74±423 and 63770.08±521, respectively. The study indicated that the maintenance cost of cross-bred cows was significantly lower than that of murrah buffaloes in all holding size groups. It is also observed from the study that increase in holding size, the maintenance cost was decrease in both milch ruminants. The net maintenance cost indicated similar trend as the maintenance cost.

Table 2 Cost of milk Production per litre of C.B. Cows and M. Buffaloes

Items/Holding Size	Cross-bred cows	Murrah buffaloes	Test of significance
Maintenance Cost			
I	55802.12 ±428 (16)	63329.78 ± 506 (11)	4.61^{++}
II	52732.48 ± 396 (11)	64276.24 ± 481 (9)	7.12^{++}
III	53193.76 ± 449 (18)	64357.72 ± 476 (17)	5.38^{++}
IV	53092.64 ± 461 (19)	63958.14 ± 517 (22)	6.96^{++}
V	52443.74 ± 423 (9)	63770.08 ± 521 (08)	11.73^{++}
Overall	53452.95 ± 433 (73)	63938.40 ± 501 (67)	7.64^{++}
Dung value			
I	3017 ± 22.6 (16)	3986 ± 39.5 (11)	6.91^{++}
II	3048 ± 22.7 (11)	4016 ± 43.2 (9)	7.22^{++}
III	3109 ± 30.4 (18)	4084 ± 36.7 (17)	11.92^{++}
IV	3144 ± 26.4 (19)	4167 ± 37.6 (22)	14.24^{++}
V	3191 ± 27.2 (9)	4218 ± 34.8 (8)	14.71^{++}
Overall	3102 ± 27.0 (73)	4094 ± 38.1 (67)	11.36^{++}

Net maintenance Cost			
I	52785.12 ± 396 (16)	59343.78 ± 481 (11)	5.16^{++}
II	49684.48 ± 367 (11)	60260.24 ± 443 (9)	4.93^{++}
III	50084.76 ± 408 (18)	60273.72 ± 436 (17)	4.16^{++}
IV	49948.64 ± 417 (19)	59791.14 ± 481 (22)	5.22^{++}
V	49252.74 ± 396 (9)	59552.08 ± 467 (8)	5.71^{++}
Overall	50351.15 ± 397 (73)	59844.19 ± 461 (67)	4.98^{++}
Cost of milk production per litre			
I	22.16 ± 0.12 (16)	30.86 ± 0.21 (11)	12.14^{++}
II	20.48 ± 0.19 (11)	30.04 ± 0.28 (9)	11.67^{++}
III	19.97 ± 0.20 (18)	29.16 ± 0.34 (17)	14.32^{++}
IV	19.39 ± 0.16 (19)	28.23 ± 0.26 (22)	13.11^{++}
V	18.53 ± 0.10 (9)	27.02 ± 0.29 (8)	14.81^{++}
Overall	20.11 ± 0.15 (73)	29.06 ± 0.28 (67)	12.73^{++}
Input output ratio			
I	1: 1.35 ± 0.01 (16)	1: 1.23 ± 0.03 (11)	6.21^{++}
II	1: 1.46 ± 0.02 (11)	1: 1.26 ± 0.02 (9)	5.93^{++}
III	1: 1.50 ± 0.01 (18)	1: 1.30 ± 0.03 (17)	7.26^{++}
IV	1: 1.55 ± 0.01 (19)	1: 1.35 ± 0.03 (22)	7.94^{++}
V	1: 1.62 ± 0.02 (9)	1: 1.41 ± 0.04 (8)	8.03^{++}
Overall	1: 1.50 ± 0.02 (73)	1: 1.31 ± 0.03 (67)	7.19^{++}

Note : Figure in parenthesis indicate number of animals

NS = Non Significant + = Significant $p \leq 0.05$

++ = Significant $p \leq 0.01$

The dung value of cross-bred cows and murrah buffaloes were found to be Rs. 3017 ± 22.6 and 3986±39.5, 3048±28.7 and 4016 ±43.2, 3109 ± 30.4 and 4084±36.7, 3144±26.4 and 4167±37.6 and 3191±27.2 and 4218±34.8 in 1st, IInd, IIIrd, IVth and Vth holding size groups, respectively. The dung value of cross-bred cows were significantly (P≤0.01) much lower than that of murrah buffaloes in all holding size groups. The dung value was slightly increase with increase holding size in both ruminants.

It is also observed from the table that the cost of milk production per litre of cross-bred cows and Murrah buffaloes were Rs.22.16±0.12 and 30.86±0.21, 20.48±0.19 and 30.04±0.28, 19.97±0.20 and 29.16±0.34, 19.39±0.16 and 28.23±0.26 and 18.53±0.10 and 27.02±0.29 in Ist, IInd, IIIrd, IVth and Vth holding size groups, respectively. The cost of milk production per litre in murrah buffaloe was much higher than that of cross-bred cows in all holding size groups. This was due to higher milk production performance and lower maintenance cost of cross-bred cows than muffah buffaloes. The table 2 also revealed that the cost of milk production per litre decrease with increase in the holding size in both the species of ruminents[1,2].

The input- output ratio of cross-bred and murrah buffaloes were found to be Rs. 1:1.35±0.01 and 1:1.23±0.03, 1:1.46±0.02 and 1:1.26±0.02, 1:1.50±0.01 and 1:1.30±0.03, 1:1.50±0.01 and 1:1.35±0.03 and 1:1.62 ± 0.02 and

1:1.41±0.04 in Ist, IInd, IIIrd, IVth and Vth holding size groups, respectively.

The input-output ratio was significantly greater in cross-bred cows than that of Murrah buffaloes in all holding size groups. The table further revealed that input-output ratio of cross-bred cows as well as Murrah buffaloes was increased with increase in holding size groups.

Our results on milk production as well as on cost of milk production and input-output ratio are similar with those of others reported in the past[1, 2, 3, 4].

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