

## **Effect of herd size on cost and production of milk of cross-bred cows and Murrah Buffaloes**

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### **Abstract**

*Milk yield of cross-bred cows and Murrah buffaloes in different herd size groups viz. first, second and third, was investigated and found that per lactation milk yield of cross-breed cows was significantly higher in all herd size groups than that of Murrah buffaloes. Herd size had significant effect on milk production in cross-bred cows but not in Murrah buffaloes. Greater milk production was observed in second herd size groups of both species of animals. The cost of milk production per litre was lower in cross-bred cows than in Murrah buffaloes, due to higher milk yield and lower net maintenance cost in corss-bred cows than Murrah buffaloes. The input-output ratio and net return per litre was also greater in cross-bred cows, which revealed that maintenance of cross-bred cows was more economic than that of Murrah bufaloes.*

Key words : Herd size, lactation, Net income, cost of milk production

### **Introduction**

India is predominately an agricultural country. The prominent place of livestock production and dairying can hardly be over emphasized. Mixed farming involving integration of crop production with animal husbandry has been followed by the farmers since inception of agricultural civilization in country. Farmers are maintaining livestock as complementary enterprise to the crop production programme so as to provide additional employment and income to their family. Landless, small as well as marginal farmers cotribute significantly low milk production in our country. The cattle and buffaloes apart from giving milk also provide hides and skins when died or slaughtered. They also provide dung for raising the fertility of soil.

Indian dairy farmers have undoubtedly done the greatest task of making India number one producer of milk. The milk production in our country has consistently increased and it is currently estimated to be over 115 million metric tonnes. The per capita availability of milk is also estimated to be over 200 g/day. Thus, Indian dairying has made as remarkable progress in our country despite a large in flux in human population.

The economic of milk production could be envisaged through two angles, viz. (1) decreasing the unit cost of milk production and (2) increasing the milk productivity of milch animals. Any attempt to achieve these objectives will encourage the producers to produce more milk by mobilization of the available resources. The demand for milk and milk products

shall continue to rise due to better nutritional consciousness, which calls for increased milk production and its availability at reasonal prices.

Keeping in view the role of dairying in augmenting income of rural households through increased milk production, the present investigation was undertaken to assess the effect of herd size on cost and production of milk of cross-bred cows and Murrah buffaloes.

### **Materials and Methods**

The present investigation was conducted in two villages of C.D. Block, Bichpuri which is located close to Agra city. The demand for milk and milk products of this vast consuming centre is met mainly by the milk producers of the neighbouring villages. After selection of villages, a list of families having cross-bred cows and Murrarh buffaloes was prepared. In all, 30 dairy farms were selected for this study. There were a total of 70 animals, out of which 33 were cross-bred cows and remaining 37 Murrah buffaloes which belonged to differeent lactation number and herd size grups. Herd size was divided into 3 groups maintained in each group, viz -

- (i) First herd size group having one animal
- (ii) Second herd size group having two animals, and
- (iii) Third herd size group having more than two animals.

From each of the selected milk producers, detailed information regarding fixed capital investment, cost of animal, feed cost per animal per dairy per lactation, lactation length, feed given to milch animal,

labour charges and other charges, miscellaneous charges and milk yield per lactation per animal and sale price per litre milk were collected. The information on all aspects of production and marketing were collected through the records maintained by producers and personal interview. The data pertained to year 2008-09.

### Results and Discussion

Results on milk production of cross-bred cows and Murrah buffaloes in different herd size groups have been compiled in Table 1. The average lactation milk yield of cross-bred cows in I, II and III herd size groups were  $2808 \pm 25$ ,  $2969 \pm 36$  and  $2534 \pm 41$  litre, however, in case of Murrah buffaloes for aforesaid herd size were  $2403 \pm 19$ ,  $2470 \pm 23$  and  $1959 \pm 28$  litre, respectively. The overall average milk yield of aforesaid animals and herd size groups were  $2605 \pm 22$ ,  $2717 \pm 29$  and  $2227 \pm 35$  litre. It is observed from the table that the milk yield of cross-bred cows in all three herd size groups were found more than that of Murrah buffaloes. The statistical analysis revealed that the variation in milk yield in different herd size groups in both cross-bred cows and Murrah buffaloes were significant at 1%.

The present data also indicated that milk production of cross-bred cows increased upto II herd size group but when the herd size increased further, the level of milk production decreased significantly ( $p < 0.05$ ). The milk production of Murrah buffaloes was also similar in I and II herd size but in case of III herd size, the milk production dropped considerably.

The above observation showed that II herd size in case of cross-bred cows and I and II herd size of Murrah buffaloes are better from the stand point of feeding and better management by village families for augmenting milk production.

The data presented in Table 1 indicated that the maintenance cost of cross-bred cows and Murrah buffaloes in I, II and III herd size groups was  $32636 \pm 311$  and  $34740 \pm 541$ ,  $32828 \pm 428$  and  $34262 \pm 628$  and  $27073 \pm 391$  and  $29321 \pm 711$ , respectively. The statistical analysis indicated that maintenance cost of cross-bred cows and Murrah buffaloes have insignificant effect in different herd size groups,

whereas herd size variation in either cross-bred cows or Murrah buffaloes had significant effect on the maintenance cost of these animals. The maintenance cost of these animals decreased significantly as the size of herd increased. The net maintenance cost indicated similar trend as the gross maintenance cost.

The dung value of cross-bred cows in I, II and III herd size groups was found to be  $Rs.2310 \pm 168$ ,  $2274 \pm 175$  and  $2240 \pm 201$ , respectively, while in case of Murrah buffaloes, it was  $Rs.3120 \pm 266$ ,  $3040 \pm 276$  and  $3020 \pm 289$  in I, II and III herd size groups, respectively. The dung value was significantly much higher in Murrah buffaloes in all herd size groups than that of cross-bred cows. The herd size had significant effect on dung value in cross-bred cows but in case of Murrah buffaloes it was insignificant.

It is also observed (Table 2) that the cost of milk production per litre of cross-bred cows were  $Rs.10.80 \pm 0.46$ ,  $10.30 \pm 0.41$  and  $9.80 \pm 0.56$  while in case of Murrah buffaloes, it was  $Rs.13.20 \pm 0.60$ ,  $12.60 \pm 0.63$  and  $13.40 \pm 0.84$  in I, II and III herd size group respectively. The cost of milk production per litre in cross-bred cows was much lower than that of Murrah buffaloes in all herd size groups. This was due to higher milk production in the former than in the latter. The table also suggested that cost of milk production per litre decreased marginally with increase in the number of animals in a family or increased in the herd size in both the species had insignificant effect on the cost of milk production.

The input-output as compared was significantly ( $p < 0.05$ ) greater in different herds in cross-bred cows as compared to Murrah buffaloes. The study further revealed that input-output ratio of cross-bred cows increased with increase in the herd size of animals whereas in case of Murrah buffaloes, it also increased upto II herd size but decreased thereafter though slightly. The same trend was also observed in net return per litre of these animals.

Our results on milk production as well as on cost of milk production and input-output ratio are in agreement with these reported by Chauhan and Balister (1982), Bhaskar et al. (1991), Kumar et al. (2006), Bhaskar et al. (2007) and Singh et al. (2008).

Table 1: Milk production (litre) per lactation in different herd size groups.

S.No.	Herd size	Milk production per lactation		Overall average	Test of significance
		Cross-bred cows	Murrah buffaloes		
1.	I	$2808 \pm 25(5)$	$2403 \pm 19(5)$	$2605 \pm 22(10)$	5.57**
2.	II	$2969 \pm 36(10)$	$2470 \pm 23(10)$	$2717 \pm 29(20)$	5.99**
3.	III	$2534 \pm 41(18)$	$1959 \pm 28(22)$	$2227 \pm 35(40)$	6.25**

Table 2: Cost of milk production / lactation / animal in different herd size groups (in Rs.)

Items	Herd size/ family	Cross-bred cows	Murrah buffaloes	Overall average	Test of signifi- cance
Maintenance cost	I	32636 ± 311	34740 ± 541	33952 ± 437	0.81 NS
	II	32828 ± 428	34262 ± 628	33810 ± 500	1.21 NS
	III	27073 ± 391	29321 ± 711	28501 ± 513	1.07 NS
Net Maintenance cost	I	30327 ± 273	31720 ± 296	31266 ± 283	0.91 NS
	II	30581 ± 221	31122 ± 281	31110 ± 263	0.88 NS
	III	24833 ± 322	26251 ± 329	25840 ± 328	1.26 NS
Dung Value	I	2310±168	3120±266	2686±216	4.31**
	II	2247±175	3040±276	2700±221	3.62**
	III	2240±201	3020±289	2661±243	3.12**
Cost of milk Production/litre	I	10.80 ± 0.46	13.20 ± 0.60	12.00 ± 0.52	3.48**
	II	10.30 ± 0.41	12.60 ± 0.63	11.45 ± 0.54	2.11 *
	III	09.80 ± 0.56	13.40 ± 0.84	11.60 ± 0.73	2.06*
Input-output ratio	I	1:1.30 ± 0.02	1:1.21 ± 0.03	1:1.25 ± 0.02	2.52*
	II	1:1.36 ± 0.03	1:1.27 ± 0.02	1:1.31 ± 0.03	3.19**
	III	1:1.43 ± 0.03	1:1.19 ± 0.03	1:1.29 ± 0.03	4.36 **
Net return per litre	I	3.20 ± 0.11	2.80 ± 0.12	3.00 ± 0.11	2.52*
	II	3.70 ± 0.13	3.40 ± 0.17	3.60 ± 0.16	1.91*
	III	4.20 ± 0.18	2.60 ± 0.14	3.40 ± 0.15	4.62**

\* Significant  $p \leq 0.05$ \*\* Significant  $p \leq 0.01$ 

NS = Non-significant

Hence, it could be inferred from present study that upkeep of cross-bred cows is more profitable proposition than that of Murrah buffaloes. The study further suggested that upkeep of two animals is better from production and net return point of view for both type of milch animals.

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