

# MILK PRODUCTION OF LOCAL AND MURRAH CROSSBRED BUFFALOES AND LOCAL AND JERSEY CROSSBRED COWS ON FARMS IN THE HILLS OF EASTERN NEPAL

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## Summary

The lactation milk yields of 209 buffaloes and cattle were measured on farms in Taplejung and Dhankuta Districts in East Nepal. This includes local and crossbred buffaloes and cows. The average milk yield ( $\pm$  SD) of 97 local buffaloes was  $833 \pm 94.6$  kg whereas that for 83 local cows was only  $455 \pm 61.5$  kg. The milk yield of buffaloes decreased with number of calvings, but that for the cows increased. The milk yields of 18 Murrah crossbreds were on average 215 kg higher than the yields of local buffaloes, and the yields of 11 Jersey crossbred cows averaged 247 kg more than the local cows. Lactation length ( $\pm$  SD) which averaged  $326 \pm 100$  days for the buffaloes and  $292 \pm 98$  days for the cows, was not affected by crossbreeding. The milk yields of the crossbreds were more variable than the local buffaloes and cows. In addition to milk yield the overall productivity of a milking animal depends on calf mortality, age at first calving, calving interval, longevity, food intake, the work performance of male cattle and the meat production of male buffaloes. Among these parameters, the work performance of Jersey crossbred and local male cattle was studied later. However, other factors could not be measured.

(Key Words: Milk Yield, Lactation Length, Calving Interval)

## Introduction

For several years Murrah buffalo bulls and Jersey bulls have been used for crossbreeding in the Eastern Hills of Nepal under schemes run by His Majesty's Government of Nepal (HMGN), Non Governmental Organizations (NGOS<sup>o</sup>) and Pakhribas Agricultural Centre (PAC). The total milk production from cattle and buffaloes has been estimated to be 682,937 mt and 735,156 mt respectively (DFAMS, 1990). However the demand for milk is still not adequately met in the country. It has been reported that an estimated of 200 mt of skimmed milk powder is imported to Nepal annually at a cost of around \$ 1.2 million (Ioshi et al., 1992). The milk yields of Murrah buffaloes in some parts of India and of Jersey cows in Europe are higher than those of local buffaloes and cows measured in the hills of Nepal, and it has been assumed that these imported animals would be more productive than

the local animals. Although there were no informations available on milk yields recorded on farms during our study conducted, very few study has been reported later. Yazman et al. (1989) reported that Murrah crossbreds produced more milk yields (1,255 kg per lactation) as compare to locals. The potential benefits of imported animals however, may not be realised in a less favourable environment. For instance, Oli (1987) demonstrated that Indian Jamunapari goats are inferior to the local goats in the Nepalese hills. Until now there have been very few studies of the performance of buffaloes and cattle on farms in Nepal, although there have been several studies on experimental stations. On-farm studies are in many ways more difficult to conduct than on-station studies, yet they are worth attempting because they give much more realistic information about the performance of animals. The aim of this study was to quantify the milk production of local and imported buffaloes and cows on farms in the Eastern hills.

## Materials and Methods

This study was carried out between 1984 and

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1987 in Taplejung District (Change, D Sangu, Hangpang, Khamlalung, Niguradin, Phakumba, Phulhari and Sangu Panchayats) and Dhankuta District (Ghorlikharka, Hattikharka, Muga, Murtidbunga, Pakhribas, Phalate and Sannu Panchayats). Farmers with crossbred buffaloes and cows were already known to the field staff of Pakhribas Agricultural Centre. All these farmers, together with neighbouring farmers who owned lactating animals were asked to join the survey. A total of 150 farms were included in the survey. The range of exotic blood level of Crossbred cows and buffaloes included in this study was 25 to 50 per cent. Farmers were given a measuring cup and asked to record the milk production of their animals every day. The calf was allowed to suckle one quarter as per their traditional system and the milk production of the other three quarters was measured and reported in this study. The management systems were almost similar to all lactating animals. However, majority of the farmers reported that buffaloes and crossbred animals are better cared than locals in terms of feeding. Field staff visited each month to check that the instructions were being carried out correctly, and to record other events such as calving. Records were started for a total of about 250 animals, but because some animals were sold, some died, or for other reasons, records for a complete lactation were obtained for only 209 animals. The milk yield reported in this study in order of parity do not refer to successive lactations for all animals.

Although cows and female buffaloes are used for work in many parts of the World, they are never used in Nepal for work. Similarly, cattle (male and female) are not legally authorised to slaughter in Nepal and females of other species as well. Buffaloes are the largest animals and crossbred of Murrah and jersey are considerably larger than the locals.

Significant "T" test was used to compare the milk yield between the local and crossbred buffaloes and cows.

### Results

The milk production of 97 local buffaloes, 18 Murrah crossbred buffaloes, 83 local cows and 11 Jersey crossbred cows were measured. The milk yields per lactation are summarised in tables

1 and 2. Each value refers to a different animal; successive lactations were not measured.

#### Milk yields of local animals

The average milk yield of the local buffaloes was  $833 \pm 94.6$  kg/lactation, whereas that for the local cows was only  $455 \pm 61.5$  kg/lactation. These means are both considerably above those of 255 kg for buffaloes and 235 and 371 kg for cows reported from livestock stations (Keshary and Shrestha, 1980).

#### Milk yields of murrah and Jersey crossbred cows

The milk yield of each Murrah crossbred buffalo and Jersey crossbred cow was compared with the mean milk yield of local animals of the same parity. On average the milk yields of the Murrah crossbred buffaloes were 215 kg or 25 per cent higher than those of the local buffalo cows, but analysis using the "T" test showed that this difference was not statistically significant ( $p > 0.05$ ). However Murrah crossbreds produced more milk yield which ranged from 485 to 1,270 kg per lactation.

Similarly, the milk yields of the Jersey crossbred cows were on average 247 kg or 54 per cent higher than those of the local cows. Statistical analyses using "T" test showed that the difference was significant ( $p < 0.05$ ). The Jersey crossbreds produced more milk yield which ranged from 504 to 879 kg per lactation. Joshi et al. (1992) reported that 50 percent Jersey crossbreds produced 3.4 times more milk per lactation (local 321 ltr and 50 percent Jersey crossbreds 1,100 ltr per lactation. This clearly shows that genetic potential of our local cows are very poor in terms of milk production.

#### Lactation length

The average duration of lactation length ( $\pm$  SD) was  $326 \pm 100$  days for the local buffaloes and  $292 \pm 98$  days for the local cows. On average the lactation length of the Murrah crossbred buffaloes was 5 days shorter than that of the local buffaloes and the lactation length of the Jersey crossbred cows was 29 days longer than that of the local cows. Neither of these differences was statistically significant ( $p > 0.05$ ).

#### Variability of milk yield and lactation length

A measure of the variability of a measurement

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is given by its standard deviation. The standard deviations of milk yield and lactation length are already shown in table 1 and 2.

Table 1 and 2 showed that for both measurements for both species, the standard deviations of the crossbred animals were higher than for the local animals. This means that the crossbreds were more variable than the local animals. The variances (i.e. the squares of the standard deviations) were compared using the F-test. The variability of lactation length was not significantly

greater for the crossbreds than for the local animals. But for milk yield the variability of the Murrah crossbreds was significantly greater ( $p < 0.05$ ) than the local buffaloes, and the variability of the Jersey crossbreds was highly significantly greater ( $p < 0.01$ ) than the local cow. The reason for more variability of crossbred animals is due to differences in the exotic blood level, and management practices offered by individual farmers.

TABLE 1. MILK YIELDS OF LOCAL AND MURRAH CROSSBRED BUFFALOES

Parity	Local buffaloes		Murrah crossbred buffaloes	
	n	Av yield (kg) per lactation	n	Av yields (kg) per lactation
1	10	918	5	1,078
2	22	856	2	1,183
3	26	874	3	854
4	23	822	2	1,246
5	9	825	4	1,270
6	5	625	2	485
7	1	322		
8	1	332		
Av milk yield ( $\pm$ SD)	97	833 $\pm$ 94.6	18	1,048 $\pm$ 564.5
Av lactation length ( $\pm$ SD)	97	326 $\pm$ 100	18	321 $\pm$ 120

TABLE 2. MILK YIELDS OF LOCAL AND JERSEY CROSSBRED COWS

Parity	Local cows		Jersey crossbred cows	
	n	Av yield (kg) per lactation	n	Av yields (kg) per lactation
1	19	397	2	518
2	21	445	3	504
3	16	513	4	879
4	13	419	2	827
5	9	505		
6	2	724		
7	2	398		
8	1	464		
Av milk yield ( $\pm$ SD)	83	455 $\pm$ 61.5	11	702 $\pm$ 345.7
Av lactation length ( $\pm$ SD)	83	292 $\pm$ 98	11	321 $\pm$ 128

### Parturition interval

The parturition interval, defined as the period between successive calvings, was calculated for those buffaloes and cows where successive calvings

were recorded. The results are summarised in table 3. No values were obtained for Jersey crossbreds.

The observed mean parturition intervals of

the Murrah crossbred buffaloes and the local buffaloes were both about 600 days and not significant different each other ( $p > 0.05$ ), but the observed mean parturition interval of the local cows was about 480 days. These observed means

are likely to be underestimates of the true means since animals which did not calve twice within the experimental period were not included in the analysis.

TABLE 3. PARTURITION INTERVALS (DAYS)

	n	Mean $\pm$ SE
Local buffaloes	16	602 $\pm$ 33
Murrah crossbred buffaloes	6	596 $\pm$ 69
Local cows	13	479 $\pm$ 26

### Discussion

The data presented in this study show that the lactation milk yields of Jersey crossbreds and Murrah crossbreds in the Eastern hills of Nepal are greater than the milk yields of local animals. This does not, however, mean that these imported animals are better in other aspects. Even though it is generally accepted that under exceptionally good management milk production increases as the percentage of temperate-type blood in cattle increases, mortality to first calving also increases (Williamson and Payne, 1978). Mortality of young animals, age at puberty (or at first calving), calving interval, longevity and food intake are all important factors which affect the overall productivity of a farmer's herd, but none have been measured in the study carried out during the period. For cattle in the hills of Nepal, milk is a minor product, so that milk production is not a good sole measure of performance. A study was therefore carried out for the work output of local and Jersey crossbred oxen in collaboration with PAC and Centre for Tropical Veterinary Medicine, Edinburgh. The result showed that there is no significant difference in the work output of local Vs Jersey crossbred oxen in the hills (Pearson, 1990).

For buffalo, which are used for meat production, some measure of growth and food consumption would be useful. It is difficult to measure the weights of buffalo in the field, but chest girth could be used as a measure of the relative growth of crossbred and local buffaloes. The heart girth of local Nepali buffalo, Murrah crossbred, local cattle and Jersey crossbred has been reported to be 178 cm, 182 cm, 134 cm and 142 cm respect

ively in a study carried out later in PAC command areas (Gatenby et al., 1988).

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