SEASONAL IMPACT OF RATIONS ON MILK YIELD OF MARATHWADI BUFFALO*

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ABSTRACT

The availability of rations in three seasons (monsoon, winter and summer) and its relative importance on milk yield of Marathwadi buffalo in rural areas of Marathwada region was assessed. The results of the information collected from the 160 sample farmers of the region rearing 210 milch Marathwadi buffaloes is given below. Overall daily ration of milch buffalo consisted of $5.44 \pm 0.15$, $5.10 \pm 0.13$ and $2.19 \pm 0.16$ kg green fodder, dry fodder and concentrates, respectively. The average daily milk production throughout the lactation of buffalo was recorded as $4.14 \pm 0.17$ kg. The linear production function analysis has given high significant values for coefficient of determination ($R^2$) and revealed significant impact of green fodder, dry fodder and concentrate on increasing milk yield in all the seasons.

INTRODUCTION

The cost of feeding milch animals constitutes 60 to 70 per cent of the total cost of milk production, whereas, the concentrates alone cost 60 per cent of the total feed cost (Puri and Singh, 1964). The supply of quality feeds and fodders to dairy animals is the major requirement for boosting up the dairy production, since maximum expression of genetic potentiality of animal depends on adequate nutrition. This is ensured by supplying sufficient quantity of good quality roughages and proper concentrates. To know the relative importance of green fodder, dry fodder and concentrates on milk yield in farmer's herds, this study was undertaken with following objectives.

1. To estimate the daily intake of rations by buffaloes, and
2. To know the impact of ration on increasing the milk yield of buffaloes in Marathwada region.

MATERIAL AND METHODS

By using multistage random sampling plan, records of 210 milch Marathwadi buffaloes from 15 villages of Marathwada region were utilized for the study. Information about the feeding practices followed by farmers for their milch buffaloes, were elicited on a pretested questionnaires during three seasons viz. monsoon, (June to September), winter (October to January) and summer (February to May). The quantity of feeds and fodder offered to lactating buffaloes during twenty four hours was recorded by actual weighting. The observation of milk production was recorded by attending the milking monthly once on a fixed day throughout the lactation. Mean, standard error for dependent and independent variable were calculated. Regression analysis by Snedecor and Cochran, 1980) was used to determine the relative importance of green fodder, dry fodder and concentrates on milk yield in different seasons and round the year.

RESULTS AND DISCUSSION

On an average daily ration of buffalo contained (Table 1) $5.44 \pm 0.15$, $5.10 \pm 0.13$ and $2.19 \pm 0.16$ kg of green fodder, dry fodder and concentrates, respectively. Maximum green fodder was supplied in winter season ($6.64 \pm 0.20$ kg/h/d), while minimum in summer. However, average green fodder was adjusted accordingly to its seasonal availability. The highest supply of dry fodder was recorded during summer season, apparently because of non-availability of green fodder and poor

* Part of M.Sc. thesis of first Author.
Table 1. Average daily intake of green fodder, dry fodder and concentrate and production of milk yield by Marathwadi buffalo in three seasons (kg ± S.E.)

<table>
<thead>
<tr>
<th>Season</th>
<th>Green fodder (kg)</th>
<th>Dry fodder (kg)</th>
<th>Concentrate (kg)</th>
<th>Milk yield (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monsoon</td>
<td>5.87±0.21</td>
<td>4.17±0.21</td>
<td>2.27±0.09</td>
<td>3.77±0.09</td>
</tr>
<tr>
<td>Winter</td>
<td>6.64±0.20</td>
<td>5.21±0.19</td>
<td>2.06±0.09</td>
<td>4.49±0.09</td>
</tr>
<tr>
<td>Summer</td>
<td>3.79±0.26</td>
<td>5.92±0.20</td>
<td>2.25±0.08</td>
<td>3.89±0.10</td>
</tr>
<tr>
<td>Average</td>
<td>5.44±0.15</td>
<td>5.10±0.13</td>
<td>2.19±0.16</td>
<td>4.14±0.17</td>
</tr>
</tbody>
</table>

Table 2. 'Z' values for difference of means in milk yield

<table>
<thead>
<tr>
<th>Season interact</th>
<th>'Z' Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monsoon verses winter</td>
<td>5.14**</td>
</tr>
<tr>
<td>Monsoon verses summer</td>
<td>0.85</td>
</tr>
<tr>
<td>Winter verses summer</td>
<td>4.28**</td>
</tr>
</tbody>
</table>

* Significant at 0.05 per cent level.

Table 3. Impact of green fodder, dry fodder and concentrates on milk yield (Y)

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Independent variables (X)</th>
<th>F values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intercept (kg) b₀</td>
<td>b₁</td>
</tr>
<tr>
<td></td>
<td>Green fodder x₁ (kg) b₁</td>
<td>Dry Fodder x₁ (kg) b₁</td>
</tr>
<tr>
<td>Monsoon</td>
<td>1.74</td>
<td>0.069** (0.027)</td>
</tr>
<tr>
<td>Winter</td>
<td>1.72</td>
<td>0.156** (0.024)</td>
</tr>
<tr>
<td>Summer</td>
<td>1.97</td>
<td>0.340** (0.022)</td>
</tr>
<tr>
<td>Average</td>
<td>2.19</td>
<td>0.150** (0.021)</td>
</tr>
</tbody>
</table>

Figures in parentheses are S.E. of b₁.
The prediction equation Y = b₀ ± b₁x₁ ± b₂x² ± b₃x³

The results revealed that in monsoon season coefficient of multiple determination (R² = 0.388) was highly significant indicating thereby better fit. The same trend was observed in case of winter, summer and round the year with R² = 0.463, 0.324 and 0.376, respectively (Table 3).

The partial regression coefficient attached to green fodder, dry fodder and concentrate variables were positive and highly in quality and quantity of green fodder available, ambient temperature and humidity may attribute to the variations in milk yield which can be reduced by better feeding and other managerial practices as reported by Rohilla and Verma, 1998.

The variation in the daily milk production was observed in each season. On an average daily milk production was 4.14 ± 0.07 kg. Significantly (p<0.05) higher production was obtained during winter season (Table 2) than rest of the seasons as per Murida and Tripathi, 1990. The seasonal fluctuations in quality and quantity of green fodder available, ambient temperature and humidity may attribute to the variations in milk yield which can be reduced by better feeding and other managerial practices as reported by Rohilla and Verma, 1998.

The results revealed that in monsoon season coefficient of multiple determination (R² = 0.388) was highly significant indicating thereby better fit. The same trend was observed in case of winter, summer and round the year with R² = 0.463, 0.324 and 0.376, respectively (Table 3).

The partial regression coefficient attached to green fodder, dry fodder and concentrate variables were positive and highly
significant ($P < 0.01$) in winter, summer and round the year. In monsoon season partial regression coefficient attached to green fodder, dry fodder and concentrates variable was positively significant at 5 per cent probability level, whereas, the effect of dry fodder and concentrate also achieved the significance at 1 per cent probability.

A close perusal of results (Table 3) indicated that a unit increase in green fodder, dry fodder and concentrate influenced the milk yield by 0.069, 0.097 and 0.536 kg in monsoon season and by 0.156, 0.215 and 0.293 kg in winter season, respectively. These values would help in predicting probable milk yield during monsoon and winter seasons at farmers level. The predication equation of milk yield during winter was:

$$Y = 1.72 \pm 0.156 x^1 \pm 0.215 x^2 \pm 0.293 x^3$$

Where $x^1$, $x^2$ and $x^3$ are the respective feed ingredients ($R^2 = 46.3$ per cent).

The result from Table 1 also indicated that in summer the milk yield of buffaloes increased by 0.340 kg with one kg increase in green fodder by keeping the other variable at constant level where as milk yield increased by 0.359 kg with increase in one kg of concentrates by keeping other variable at constant level (Sexena and Upadhyay, 1985). The prediction equation of milk yield from green fodder, dry fodder and concentrate studied round the year can be given as under and this equation can be used to forecast for further research work:

$$Y = 2.19 \pm 0.150 x^1 \pm 0.096 x^2 \pm 0.288 x^3$$

Where $x^1$, $x^2$ and $x^3$ are the respective feed ingredients ($R^2 = 37.6$ per cent).

The $R^2$ values for monsoon, winter and summer seasons shows significant influence of feeding factor on milk yield. The present finding is inline with the result of Jacob et al. (1996).

**CONCLUSION**

It was concluded from foregoing discussion that there was significant effect of enhanced use of concentrates followed by green fodder and dry fodder on milk production of Marathwadi buffalo.

**REFERENCES**


