# The Pharma Innovation

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# Effect of green fodder on resting and feeding behaviour of crossbred and Gir cow during winter months

**Om Prakash Choudhary, RP Jat, Subhash Yadav, Sohan Lal Boori, Gotam Chopra and Vinod Kumar Kudi**

**Abstract**
This investigation was conducted at animal farm S.K.N. College of Agriculture, Jobner (Rajasthan) on 20 milking cows (which includes 10 Gir and 10 Crossbred) were divided into four different group and subjected to four dietary treatments were formulated. i.e., Green Lucerne 10.0 kg + Wheat straw ad-lib + Concentrate for $T_1$ Cross-bred and $T_3$ Gir cows group and Green Lucerne 20.0 kg + Wheat straw ad-lib + Concentrate for $T_2$ Cross-bred and $T_4$ Gir cows group and studied for their feeding and resting behaviour. Average maximum and minimum temperature ($^0$C) were 25.60±0.245 and 15.64±0.285 in closed barn. Average eating time (minutes/day) was significantly ($P<0.05$) higher in $T_2$ (Crossbred group) 307.70 than $T_1$ (Crossbred group) 292.90, $T_4$ (Gir group) 272.40 and $T_3$ (Gir group) 266.60. Average resting time (minutes/day) was significantly ($P<0.05$) higher in $T_3$ (688.20) than $T_4$ (680.60), $T_1$ (660.40) and $T_2$ (653.50) during period of 24 hour.

**Keywords:** green fodder, resting and feeding Behaviour, cross-bred, Gir cow

## Introduction

Livestock in India has a very important role in the agricultural sector, Indian economy and consequently in its rural economy. About 20.5 million people depend upon livestock for their livelihood. Livestock contributed 16% to the income of small farm households as against an average of 14% for all rural households. India has 192.49 million cattle population, which includes 50.52 million cross-bred/exotic and 142.11 million Indigenious cattle (Anonymous 2019). Cattle are a very important farm animal which play a significant role in the economy of the country by providing milk, manure, fiber, skins and draught power with a very little input. Gir is a famous milch cattle breed in Indegenious breeds. The native trait of this breed is Gir forest of Kathiawar including Junagadh Bhavnagar, Rajkot and Amreli districts of Gujarat and also found in some parts of Maharashtra and Rajasthan. Cattle of this breed are famous for their tolerance to stress conditions and resistant to various tropical diseases. Cross-breeding programme of dairy cattle has played significant role in attaining India's top position as highest milk producer country of the world. The green fodders are also good sources of energy, protein, fat, minerals and vitamins. Furthermore, the relative optimum crude protein and energy requirements also depend on feeding system, rumen ecology, animal productivity, efficiency of nutrient utilization, breed and species etc. the limited and controversial scientific information regarding comparative feeding efficiency of breeds. There for, the present study will be done to assess the effect of green fodder on feeding and resting behaviour of Cross-bred and Gir Cows during winter months.

## Materials and Methods

The experiment was conducted between 22 December 2018 to 21 March 2019 (90 days) at animal farm, S.K.N. college of Agriculture, Jobner, Jaipur (Rajasthan, India) to assess the effect of green fodder on behavioural pattern (feeding and resting) of cross-bred and Gir cows during winter.

**Experimental Animals and Treatments:** Twenty lactating 10 Cross-bred (Tharparkar/Sahiwal x Holstein Friesian) and 10 Gir lactating cows were selected for the experiment. They were randomly divided into four groups of five in each group on the basis of nearest in their body weight and milk yield and four dietary treatments were formulated. i.e., Green Lucerne (10 kg) + Wheat straw ad-lib. + Concentrate for $T_1$ Crossbred and $T_3$ Gir cow

group and Green Lucerne (20 kg) + Wheat straw ad-lib. + Concentrate for $T_2$ Crossbred and $T_4$ Gir cow group and studied for their behavioural pattern.

**Housing and Management of Experimental Animals:** Similar housing and managemental facilities were provided to all the groups. The experimental cows were kept individually tied day and night during experimental period in cattle shed as Tail-to-Tail system of Conventional barn. The animals were offered individual feeding. The floor area was paved with cement concrete duly corrugated to prevent the animal from slipping.

**Parameters Studied and Observation Taken:** The meteorological observations, feeding and resting behaviour were recorded during experiment period.

**Meteorological Observations:** Meteorological observations like maximum and minimum temperatures were recorded at 9.00 AM and 3.00 PM during experiment.

**Animal Behaviour:** The actual feeding and resting behaviour of cows were recorded for two consecutive days and nights (24 hour) of monthly interval during the experiment. The following observations were recorded during experimental period.
1. Time spent in eating of feed and fodder.
2. Time spent in laying down.

**Statistical Analysis of Data:** The experiment data were statistically analyzed using standard statistical methods (Snedecor and Cochran, 1994). The experiment planned with subjected to analysis of variance (ANOVA) for a (2X2) factorial randomized block design (FRBD) and the means were tested by least significance difference.

**Results and Discussion**
The data collected during the experiment were subjected to standard methods of statistical analysis and presented in this chapter in the form of tables, figures along with the implications of the results under following heads.

**Temperature of Conventional Barn during Experimental Period:** The average maximum temperature in morning was 24.36±0.141 °C and 26.84±0.102 °C in evening and mean

maximum temperature was 25.60±0.245 °C, respectively. The mean minimum temperature was 14.63±0.214 °C and 16.66±0.228 °C in morning and evening. Average minimum temperature during winter season in closed barn was 15.64±0.285 °C, respectively. These values are in agreement with findings by Thomas *et al.* (1978) [10]. Both maximum and minimum temperature values in closed barn. The data on climate variables under closed barn condition is presented in Table 1.

**Table 1:** Average minimum and maximum temperature ($^0$C) in conventional barn.

| | Parameter | | |
|---|---|---|---|
| | **Morning** | **Evening** | **Mean** |
| Maximum Temperature | 24.36±0.141 | 26.84±0.102 | 25.60±0.245 |
| Minimum Temperature | 14.63±0.214 | 16.66±0.228 | 15.64±0.285 |

**Behavioural Observation:** Behaviour is basically inherited through genes and modified through environment. Although animals of a particular species have some common specific behavioral pattern yet several factors may influence variation in the same. In fact, an animal's makes behavioral adjustments to adapt to any change in microenvironment. Thereby in the present study feeding and resting time of cross-bred and Gir cows have been investigated.

**Eating Time:** The average eating time was 179.20±0.550, 190.50±0.423, 163.90±0.372 and 166.40±0.521 minutes during day time in $T_1$, $T_2$, $T_3$ and $T_4$, respectively. The average eating time was 113.70±0.651, 117.20±.0514, 102.70±0.561 and 106.0±0.564 minutes during night time in respective treatments. The overall mean of eating time was 292.90±0.629, 307.70±0.388, 266.60±0.495 and 272.40±0.539 minutes per day in $T_1$, $T_2$, $T_3$ and $T_4$ respectively. The result indicated that the eating time of cows under $T_2$ and $T_1$ was higher ($P<0.05$) as compared to $T_3$ and $T_4$ group. The average eating time was higher in group $T_2$ compared to $T_1$ in (crossbred) and also higher in group $T_4$ compared to $T_3$ in (Gir cows). Overall average eating time was higher in group $T_2$ and $T_1$ in (crossbred) compared to $T_4$ and $T_3$ (Gir cows). This is in agreement with the eating times found in well designed with Cook *et al.*, (2004) and Sharma and Singh (2002). The eating time was presented in Table 2 and appendix I.

**Table 2:** Average eating time (in minutes) of cows under different treatments.

| Parameter | Cross-Bred | | Gir cow | |
|---|---|---|---|---|
| | **$T_1$** | **$T_2$** | **$T_3$** | **$T_4$** |
| Day | 179.20$^b$±0.550 | 190.50$^a$±0.423 | 157.50$^d$±0.286 | 164.40$^c$±0.531 |
| Night | 113.70$^b$±0.651 | 117.20$^a$±0.514 | 96.20$^d$±0.526 | 103.0$^c$±0.442 |
| 24 hours | 292.90$^b$±0.629 | 307.70$^a$±0.388 | 266.60$^d$±0.495 | 272.40$^c$±0.539 |

Means having different superscripts differ significantly ($P<0.05$)

**Appendix I:** Average fortnightly eating time (minutes/day) per animal of different treatment.

| Monthly | **$T_1$** | **$T_2$** | **$T_3$** | **$T_4$** |
|---|---|---|---|---|
| I | 286.09±0.513 | 310.32±0.573 | 264.80±0.754 | 259.05±0.824 |
| II | 290.63±0.465 | 297.24±0.477 | 266.0±0.687 | 282.41±0.531 |
| III | 301.98±0.431 | 315.55±0.407 | 269.0±0.613 | 275.74±0.645 |
| Mean | 292.90±0.629 | 307.70±0.388 | 266.60±0.495 | 272.40±0.539 |

**Resting Time:** The average resting during day time was 246.60±0.590, 242.50±0.794, 243.0±0.682 and 239.30±0.880 minutes in T, $T_2$, $T_3$ and $T_4$ respectively. The average resting

time was 413.80±0.555, 411.0±0.447, 445.20±0.759 and 441.30±0.739 minutes during night in respective treatments. The overall mean of resting time was 660.40±0.590,

653.50±0.572, 688.20±0.800 and 680.60±0.720 minutes per day in $T_1$, $T_2$, $T_3$ and $T_4$ respectively. The average resting time of cows higher under group $T_1$ compared to $T_2$ in (crossbred) and also reported higher in $T_3$ compared to $T_4$ in (Gir cow). The overall average resting time of cows under group $T_3$ and $T_4$ (Gir cow) was higher as compared to group $T_1$ and $T_2$ (crossbred). Similar results were obtained by Hafez (1975) [5], Jensen *et al.*, (2005) [6, 7], Munksgaard *et al.*, (2005) [6] and Regar (2017). The resting time was presented in Table 3 and appendix II.

**Table 3:** Average resting time (in minutes) of cows under different treatment.

| Parameter | Cross-Bred | | Gir cow | |
|---|---|---|---|---|
| | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
| Day | 246.60$^a$±0.569 | 242.50$^c$±0.794 | 243.0$^{bc}$±0.682 | 239.30$^d$±0.880 |
| Night | 413.80$^{cd}$±0.555 | 411.0$^d$±0.447 | 445.20$^a$±0.759 | 441.30$^b$±0.739 |
| 24 hours | 660.40$^c$±0.590 | 653.50$^d$±0.572 | 688.20$^a$±0.800 | 680.60$^b$±0.720 |

Means having different superscripts differ significantly ($P<0.05$).

**Appendix II:** Average monthly resting time (minutes/day) per animal of different treatment.

| Monthly | $T_1$ | $T_2$ | $T_3$ | $T_4$ |
|---|---|---|---|---|
| I | 649.06±0.732 | 656.60±0.621 | 690.95±0.756 | 694.89±0.894 |
| II | 675.52±0.489 | 641.08±0.735 | 696.46±0.456 | 685.36±0.465 |
| III | 656.62±0.621 | 662.81±0.549 | 677.19±0.756 | 661.54±0.357 |
| Mean | 660.40±0.590 | 653.50±0.572 | 688.20±0.800 | 680.60±0.720 |

## Conclusion
Therefore, It is concluded that the feeding level of 20 kg green Lucerne fed group was significantly ($P<0.05$) higher in eating time and low in resting time as compared to 10 kg green lucerne fed group. And in relation to breeds resting time was significantly ($P<0.05$) higher and eating time was low in Gir cows' group ($T_3$ and $T_4$) as compared to Cross-bred group ($T_1$ and $T_2$). From studies designed to make cattle work for access to a place to rest, it would appear that cows target around 9-12 h/d target lying time.

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