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RESEARCH ARTICLE

EFFECT OF UREA TREATMENT OF WHEAT STRAW FED AS COMPLETE FEED UNDER LOOSE HOUSING SYSTEM ON THE PERFORMANCE OF CROSS BRED HEIFERS

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ABSTRACT

Complete feed not only provides the required nutrients in proper proportion at a time, but, it also improves the feeding values. Keeping in view the above, a study was conducted on 18 cross bred heifers; these were distributed to form three treatment groups having six heifers in each. Treatment group I was the control and was offered wheat straw adlib and 1.5 kg concentrate mixture, treatment group II was offered complete feed 'sani' based on wheat straw and concentrate mixture adlib; and treatment group III was also offered complete feed 'sani' but in this group urea treated wheat straw was used. The intake of dry matter (DM), crude protein (CP), total digestible nutrient (TDN) and metabolizable energy (ME) was significantly lower ($P< 0.05$) when conventional feeding system was used. The intake of above was improved when the feed was offered as complete feed "sani" and the intake of nutrients was further improved when wheat straw was treated with urea and used as complete feed "sani". Lowest body weight gain was observed in the conventional feeding system and highest in complete feed "sani" using urea treated straw but differences were at par between group I & II and group II & III.

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INTRODUCTION

We have a large cattle population in our country representing 1/5th of total cattle population. The experience in the area of feeding genetically improved cattle has been that it is easier to produce genetically potential cow but it is very difficult to feed her to exploit fully her genetic potential. Grazing land is negligible; the supply of green fodder is limited in some areas. The only feed available for most of the animals in rural areas is poor quality roughage. Out of many methods urea treatment of poor quality roughages and preparation of "sani" only seems to be practical. The present study was undertaken to find out the effect of complete feed "sani" prepared out of untreated and urea treated wheat straw vis-à-vis conventional feeding under loose housing system.

MATERIALS AND METHODS

Eighteen cross bred (1/2 Jersey + 1/4 Holstein Friesian + 1/4 Gir) heifers between the age of about 7-14 months were selected from the young stock herd of the livestock farm, adhartal, Jabalpur. Complete feed was prepared by mixing 50% each of wheat straw (urea treated or untreated) and concentrate mixture on dry matter basis, and adding water then mixing. The average of the three body weights was taken as the body weight of the animals; the heifers were distributed into three treatment groups as per their body weight. Treatment group I was the control conventional feeding was followed in this group ie. Wheat straw adlib and 1.5 kg concentrate mixture per heifer. Treatment group II untreated wheat straw and concentrate mixture in the ratio of 50 : 50 was fed as "sani" complete feed and to treatment group III urea treated wheat straw and concentrate mixture in the ratio of 50 : 50 was fed as "sani". The respective diets were fed to the heifers for 60 days inclusive of 7 days digestion trial at the end of experimental period.

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RESULTS

The data on average daily dry matter (DM), crude protein (CP), total digestible nutriments (TDN) and metabolicable energy (ME) intakes of heifers fed three diets during digestion trial are shown in Table 1 and mean daily nutrient uptake presented in Table 2. The intake of DM, CP, TDN and ME was significantly ($P < 0.05$) lower when conventional feeding system was used. The intake of DM, CP, TDN and ME were improved when the feed was offered as complete feed "sani" and the intake of the nutrients was further improved when wheat straw was urea treated and used as complete feed "sani". Average intake of different nutrients was observed for the entire feeding period of

60 days. The average initial and final body weight and result of body weight gain kg/day for three groups during experimental period are presented in Table 3.

Table 1. Mean daily nutrient intakes per head during digestion trial

Nutrients	Group I	Group II	Group III	CD 5%
DM (kg)	2.74±0.196	3.24±0.21	4.06±0.21	0.63
CP (gm)	317±22.88	402±26.89	509±27.55	77.92
TDN (kg)	1.30±0.09	1.64±0.12	2.10±0.12	0.33
ME (meal)	4.70±0.35	5.94±0.44	7.61±0.43	1.24
Per 100 kg				
DM (kg)	2.94±0.18	3.41±0.13	3.96±0.18	0.51
CP (gm)	340±21.65	419±13.32	496±22.99	59.48
TDN (kg)	1.39±0.08	1.70±0.05	2.05±0.09	0.23
ME (meal)	5.03±0.30	6.15±0.19	7.41±0.32	0.85
Per kg metabolic body size (W 0.75 kg)				
DM (kg)	0.09±0.003	0.10±0.002	0.12±0.003	0.016
CP (gm)	10.54±0.418	13.09±0.31	15.75±0.47	1.22
TDN (kg)	43.22±1.66	53.42±1.54	65.23±1.90	5.13
ME (meal)	156.27±6.00	193.13±5.57	235.88±6.88	13.80

Table 2. Mean daily Nutrients intake per head during experimental period

Nutrients	Group Improved	Group II	Group III
DM (kg)	2.56±0.096	2.88±0.087	3.68±0.068
CP (gm)	297±0.0097	357±0.0074	462±0.0074
TDN (kg)	1.21±0.039	1.45±0.037	1.91±0.030
ME (meal)	4.39±0.143	5.24±0.135	6.90±0.111

Table 3. Mean daily body weight gain during experimental period

Observations	Group I	Group II	Group III	CD 5%
Initial body weight kg	79.16±8.79	78.33±8.33	78.33±8.53	-
Final body weight kg	96.66±9.63	98.33±7.71	105±9.036	-
Body weight gain kg/day	0.291±0.046	0.333±0.048	0.444±0.035	0.132

The average body weight gain (kg/d/head) for treatment groups I, II and III were 0.291±0.46, 0.333±0.48 and 0.444±0.035 respectively. The differences in body weight gain were significant ($P < 0.05$). Lowest gain was observed in the conventional feeding system and highest in complete feed "sani" using urea treated wheat straw but differences were as par between group I and II and group II and III.

DISCUSSION

The heifers group I under conventional feeding system consumed 2.74 kg feed DM as against 3.24 and 4.06 kg in group II and III offered complete feed "sani" prepared out of untreated and urea treated wheat straw. Significantly ($P < 0.05$) higher DM intake by the group III given complete feed "sani" prepared from urea treated straw might be attributed to urea treatment which increased palatability is reported by many workers (Campling *et al.,* 1962) The digestibility coefficient of diet made out of urea treated straw was significantly higher treatment of wheat straw with urea treated intake of CP and TDN (along with DM) have been reported earlier by workers (Gupta 1988) Processing and blending of wheat straw with concentrate mixture also increased intake of CP and TDN (along with DM) has been reported by (Laxminarayana and Reddy 1986) Processing and blending of wheat straw with concentrate mixture also increased palatability reported others (Satyanarayana Reddy 1992), which reached the level of significance. in group III when urea treated straw was used and in group II using untreated straw although there was a increase, it did not reach the level of significance, as would revealed later by many workers (Patle *et al.,* 1992; Waje 1996).

Body weight gains and feed conversion efficiency

Significantly superior and maximum body weight gain (0.444±0.035 kg/day) was observed when complete feed "sani" prepared out of urea treated wheat straw was fed to group III. In this group, feed DM intake and intake of other nutrients were also significantly better. Significantly superior digestibility was also observed in this group. Superior gain in the body weight was due to more intake of DM, nutrients and better digestibility. In complete "sani" prepared from untreated straw (group II), body weight gain (0.333±0.048 kg/day) was lower when compared to group III but superior to the conventional feeding system (group I).

Conclusion

On the basis of above findings it may be concluded that the intake of the study parameters *viz.* dry matter (DM), crude protein (CP), total digestible nutrient (TDN) and metabolizable energy (ME) was significantly improved in group III cattle supplemented with the fed comprised of urea treated wheat straw and concentrate mixture in the ratio of 50 : 50 as "sani". Due to better intake of the nutrients, the highest body weight gain was recorded in the group, hence, the above fed is recommended for feeding the cross bred heifers under loose housing system.

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