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Investigation on the effects of supplementation of chickpea husk and boiled sesame meal on the performance of growing bulls in Myanmar

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Abstract

Four growing bulls in Yezin area were randomly allocated to a 2×2 factorial arrangement in a 4×4 Latin square design to compare the effectiveness of four diets. Four dietary treatments were $RUSC_1$ (Urea-treated rice straw + Untreated sesame meal + chickpea husk at the level of 0.1% of liveweight), $RBSC_1$ (Urea-treated rice straw + boiled sesame meal + chickpea husk at the level of 0.1% of liveweight), $RUSC_2$ (Urea-treated rice straw + untreated sesame meal + chickpea husk at the level of 0.2% of liveweight) and $RBSC_2$ (Urea-treated rice straw + boiled sesame meal + chickpea husk at the level of 0.2% of liveweight).

All dietary treatments were weekly adjusted by supplements at the level of crude protein not less than 10 %. Each feeding trial consisted of 15 days of adaptation, 7 days of preliminary feeding, 16 days of determination of voluntary intake for urea-treated rice straw and 3 days of faecal and urine collection. TDN intake (83.62 g/kg0.75 / day) for RUSC1 was satisfactory in comparison with other treatments, although the significant difference ($p < 0.05$) was not observed. Achievements for RBSC1 (63.28, 68.66, 83.18, and 73.75 %) were relatively higher than those of $RUSC_2$, $RBSC_1$ and $RBSC_2$. Slight differences in daily weight gain (0.82, 0.67, 0.51 and 0.64) were observed among the treatment means and that of $RUSC_1$ was numerically satisfied. These parameters observed in this experiment showed that feed efficiency and weight gain of RUSC1 was numerically characteristic although is not significantly ($p < 0.05$) higher than those of other dietary treatments.

Intorduction

Rice straw is the low quality roughage for ruminants. To overcome its low quality nutrient value, processing and preparation to the rice straw is needed in feeding. The common ways are treatment and supplementation to the rice straw. Pretreatment processes such as physical chopping and chemical treatments adding sodium hydroxide/ calcium hydroxide/ potassium hydroxide/ anhydrous or aqueous ammonia/ urea can improve the feeding value of rice straw by

increasing its digestible energy content or by increasing feed intake. However, urea-treated rice straw supplemented with some concentrates is being currently on research in some countries of South-East Asia (Wanapat *et al.*,1986; Trung *et al.*,1988; Lating *et al.*, 1988). Although, feeding of urea-treated rice straw to cattle was well practised in neighbouring countries, little information was available concerning about the feeding of urea-treated rice straw with and without some locally produced agricultural byproducts.

We thus conducted this experiment

-To study the feeding value of urea-treated rice straw fed to growing up bulls and to introduce the feeding practice of urea-treated rice straw to cattle in Myanmar.

-To compare the effect of untreated and boiled sesame meal and tow levels of chickpea husk at 0.1 and 0.2% of body weight on cattle performance.

MATERIAL AND METHODS

I. Experimental animals, their management and experimental period

Four growing up bulls of local breeds with similar age and body weight in Yezin area were used to evaluate for four dietary treatments. Each animal was kept in individual metabolic stalls for most of the time that enabled complete collection of faeces and urine and, determination of voluntary intake of urea-treated rice straw. The animals were fed on supplements preceding urea-treated rice straw ad. libitum. Urea-treated rice straw was fed to the animals with an excess to 10-15 % of the previous day's intake to allow *ad. libitum* and water was also given free assess. Feeding was done twice a day at 08:00 and 16:00 hours. The experiment was carried out from August to November 2000.

2. Experimental feed and experimental design

Four dietary treatments were used in this experiment. They were $RUSC_1$, $RBSC_1$ $RUSC_2$ and RBSC2 (urea-treated rice straw + heat-treated sesame meal by boiling method + chickpea husk at the level of 0.2% of body weight). The sesame meal was heated by boiling for 1h hour and left for cooling at room temperature. Four growing bulls were randomly allotted to a 2 x 2 factorial arrangement in a 4 x 4 Latin square design involving two rates of chickpea husk and untreated and heat-treated sesame meal. All dietary treatments were adjusted to be isonitrogenous at the feeding level. Dietary treatments were weekly adjusted by the supplements at the level of crude protein not less than 10%. The treatment involved urea addition of4kg/ 100 kg air dried rice straw and 100 litres of water (4 % of urea treatment). The urea-treated rice straw was kept for 21 days. Each feeding period consisted of 7 days for preliminary feeding, 16 days for determination of voluntary intake of urea-treated rice straw and 3 days for faecal and urine collection.

3. Measurements

Initial and final body weights during 16 days of determination of voluntary intake period were recorded to calculate the daily weight gain. Weighing was done in the morning before the animals were given feed and water at the start and end of determination of voluntary intake period for three consecutive days. During collection periods, daily samples of urea-treated rice straw, sesame meal and chickpea husk were taken and residues were removed and sampled before morning feeding. Faecal samples were also taken (5% of the total mass) weighed, and put into the plastic bottles. Two to three drops of formaldehyde solution was put into the bottles to prevent the putrefaction. Five % of urine samples were also taken and added H_2SO_4 to keep pH at 4.

4. Chemical analysis

Fresh samples of feedstuff and residues collected during dietary period were analyzed for dry matter, crude protein, crude fibre and ether extract by the methods carried out by A.O.A.C. (1970). Data were subjected to statistical analysis using Latin Square design and means were compared by Duncan's multiple range test.

6. Results and discussion

The TDNI of $RUSC_1$ was 5.29 kg/d and it was said to be numerically higher than the others. This might be due to higher TDN, %DM content of RUSC1. DCP, % DM of RUSC1 was also higher than the others although there were not statistically different.

It was found that the digestibilities of DM and OM of RUSC1 were 64.22 % and 70.19%, and were relatively lower than that of Tin Ngwe et al. (1993) whereas, digestibility of CP was higher (74.90%). The fibre digestibilities of $RUSC_1$, $RBSC_1$, $RUSC_2$ and $RBSC_2$ were 83.72%, 83.18%, 79.38 % and 81.09% respectively and higher than report of Tin Ngwe et al. (1993) in Myanmar. This might due to high nitrogen content of urea-treated rice straw, which lead to favour the activity of cellulolytic bacteria in the rumen. The effect of boiled sesame meal by boiling method on cattle performance is different from the finding of Tin Ngwe *et al*. (2000). This may be due to different method of heating.

Daily weight gain and feed efficiency of $RUSC_1$ were 0.82 kg/day and 10.04Kg feed/Kg LW gain. The daily weight gain of $RUSC_1$ was higher than those of others, although there were no significant differences. The feed efficiency of RUSC1 was found to be more satisfactory than others.

According to these findings, boiling of sesame meal and chickpea husk at the level of 0.2% body weight of cattle could have no effect to improve cattle performance.

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