

## NUTRITIVE VALUE OF SOME LOCAL FORAGE FOR CATTLE IN CENTRAL VIETNAM

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### ABSTRACT

Four male cattle were housed individually in metabolism pens. The daily feed intake was restricted to 50g of DM/kgW<sup>0.75</sup> and all animals were fed daily at 8:00, 14:00 and 20:00 h. The animal were fed four experimental diets (A: rice straw (70%) + molasses (28%) + urea (2%); B: urea treated rice straw (70%) + molasses (30%); C: rice straw (70%) + molasses (5%) + brew grain (23%) + urea (2%); D: urea treated rice straw (70%) + molasses (5%) + brew grain (25%)) according to a Latin Square (4 x 4) design. Each period consisted of 11 days adaptation followed by 4 days collection of faeces and urine. Feed refusals were recorded daily and water was available at all times. Faeces were quantitatively collected and the urine was also collected quantitatively be sure pH < 3 with H<sub>2</sub>SO<sub>4</sub> 10%.

The results showed that rice straw after treatment with urea digestibility of DM, OM, NDF (P<0.05) was increased and nitrogen retention also higher (P<0.05) and even better when urea treated rice straw was supplemented with brewers grain. The urinary purine derivatives was also higher (P<0.001) from these diet. This showed the diet stimulating microbes in the rumen and made more protein available to the host animal.

*Key words: Ureatreated rice straw, brewer's grain, cattle*

### INTRODUCTION

Cattle are kept as a common domestic animal in the rural areas in central Vietnam and grass is main feedstuffs. However, these feed sources normally lacking in the dry and rain seasons.

Rice is a main cash crop in the central Vietnam, so rice straw has a great potential for cattle feeding, but a lot is not used due to poor quality. This study was conducted in order to contribute the knowledge to the farmers for better use of some local feed resource for cattle production in the area.

### MATERIALS AND METHODS

**Diets.** Each animal was feeding difference diet, based on mixture of urea treated rice straw, rice straw, molasses, brew's grains residue and urea. Rice straw was treated 5% of urea, 80% of water in plastic bag.

**Animals.** Four male cattle of the same age were used, with an average live weight of 60 kg at the beginning of the study. The animals were housed individually in metabolism pens. Daily feed intake was restricted to 50g of DM/kgW<sup>0.75</sup> and all animals

were fed daily at 8:00, 14:00 and 20:00 h. Feed refusals were recorded daily and water was available at all times.

### Experiment design

The cattle were fed four experimental diets according to a Latin Square (4x4) design. Each period consisted of 11 days adaptation followed by 4 days collection of faeces and urine.

Treatment A was 70% rice straw 28% molasses and 2% urea, Treatment B was 70% Urea treated rice straw 30% molasses; treatment C was 70% rice straw 23% brew's grain, 5% molasses and 2% urea and treatment D was 70% ureatreated rice straw 25% brew's grain and 5% molasses

### Measurements

- Feed compositions (DM, CP, OM, NDF)
- Digestibility (DM, CP, OM, NDF)
- Nitrogen balance
- The excretion of purine derivative

### Sample collection

Feed samples were taken in each experimental period. Feed refusals were collected, weighed and dried at 60°C. Faeces were quantitatively collected and sampled twice a day and kept in a refrigerator at +4°C until analysis. Prior to analysis, faeces were thawed, homogenized, subsampled and dried at 60°C and ground to pass a 1- mm screen. The urine was also collected quantitatively and preserved by adding 200 ml of H<sub>2</sub>SO<sub>4</sub> 10% (be sure pH < 3) to the collection jar, sampled in 20ml bottles and stored at -20°C.

## RESULT AND DISCUSSION

Digestibility coefficients for dry matter, organic matter, NDF, crude protein and N retention (Table 3) were increased significantly with the diet of which including urea treated rice straw. Especially digestibility was highest in the diet including ureatreated rice straw with adding brewer grain. These results can be explained that the non protein nitrogen were use by rumen microbes, in other hand 50% of brewers grain protein was not degraded in the rumen according to Jong-Kyu Ha *et al* (1996) and as reported by Vu Chi Cuong (2004) the digestibility coefficient of brewers' grain was 81%.

### Feed compositions

Table 1: Feed composition on dry matter bases

Feed	DM	CP	NDF	Ash
Ureatreated rice straw	48.9	8.6	61.4	14.3
Rice straw	80.9	6.6	67.9	12.5
Molasses	75.3	11	0	7.5
Brewers grain	24.1	25	56.5	4.0

*Feed intake*

*Table 2: Feed intake g/d*

Diet	DM (g)	OM (g)	CP (g)	NDF (g)
A	1000	887	85	474
B	1000	877	93	428
C	1000	899	114	616
D	1001	897	167	571

*Digestibility and nitrogen retention*

*Table 3: Digestibility and nitrogen retention*

Diet	DM (%)	OM (%)	NDF (%)	CP (%)	N retention (g)
A	54.4 <sub>ac</sub>	48.9 <sub>abc</sub>	62.0 <sub>abc</sub>	29.1 <sub>abc</sub>	-4.5 <sub>abc</sub>
B	67.4 <sub>bd</sub>	70.1 <sub>abcd</sub>	67.0 <sub>abc</sub>	36.1 <sub>abcd</sub>	-1.8 <sub>abcd</sub>
C	56.7 <sub>ac</sub>	60.9 <sub>abcd</sub>	78.3 <sub>abc</sub>	42.2 <sub>abcd</sub>	-1.6 <sub>abcd</sub>
D	70.8 <sub>bd</sub>	72.3 <sub>bcd</sub>	86.3 <sub>bcd</sub>	60.5 <sub>bcd</sub>	0.8
SEM	2.2	5.4	5.1	6.7	0.9
P	0.001	0.036	0.022	0.032	0.016

*abc Means with different superscripts within rows are different at P<0.05*

*Comparison of purine derivative excretion*

*Table 4. Comparison of purine derivative excretion*

Diet	PD(mmol/day)	PD (mmol/kgW <sup>0.75</sup> )
A	8.2 <sub>abc</sub>	0.43 <sub>abc</sub>
B	9.9 <sub>abc</sub>	0.50 <sub>abc</sub>
C	8.3 <sub>abc</sub>	0.42 <sub>abc</sub>
D	13.5 <sub>d</sub>	0.68 <sub>d</sub>
SEM	0.9	0.05
P	0.001	0.001

*abc Means with different superscripts within rows are different at P<0.05*

The results from table 4 show clearly that the diets of which including urea treated rice straw, excreted more purine derivative in urine than the diets with untreated rice straw. This was especially so when brewers grain was used as supplement. This demonstrate clearly that rice straw after treatment with urea stimulated rumen microbes and even more when brewers grain and molasses were used as maybe expected according to Chen (1995); Orskov (2001); Makkar (2004).

## CONCLUSION

For improving use of rice straw as roughage for cattle, need some treatment and supplementation to improve extent of cellulose degradation by rumen microbes, and supplying the limiting of nutrient from for microbial activities in the rumen (Nguyen Xuan Trach, 2003).

The digestibility of rice straw after treatment with urea was increased and brewers grain as a carbohydrate source supplement to the rumen microbial of ruminant, so the farmer could be use these products, which are large by-products in Vietnam.

The purine technique has given us a new, simple and accurate tool for prediction quality of feedstuff for ruminant using of purine derivative from rumen microbial excretion in urine (International Atomic Energy Agency, 1997). The technique was successes in use for estimation of Vietnamese cattle (Vo Thi Kim Thanh *et al*, 2004, 2006).

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