doi:10.1017/S2040470010000944

The role of rice straw as a feed for sustainable beef cattle production in East Java Province, Indonesia

Marjuki Abdullah†

Department of Animal Nutrition, Faculty of Animal Husbandry University of Brawijaya Malang, Indonesia

Introduction

Forages are commonly the main feed for ruminants to get nutrients to support their lives and production. However, forages availability are also as main constraint to ruminant production in some areas of the tropics, like Java Island which is the most densely populated and most-intensified agriculture area of Indonesia. The maim issues is seasonal availability between wet and dry seasons. During the wet season, excess forage is available for animal's requirement, but this becomes scarce during the dry season. In addition, average land area owned by farmers in Indonesia, especially in Java Island is very small and often under 0.5 ha per farmer whose first priority is for food crops rather than forage production. Hence, crop residues must become the main source of fiber for cattle if variability of supply is to be overcome as a constraint to production. This study aimed to evaluate potential resources for beef cattle production in Java.

Material and Methods

Thirty two small farmers owning cattle of not more than 5 head per farm were visited every two weeks for 2 to 3 consecutive days over a one year period to monitor feeding practices for beef cattle production. During each visit, type of feedstuffs which were used in the daily ration offered was observed and their amount measured. In addition, a similar survey was undertaken in five larger farmers with more than 20 head of cattle per farm for a one month period in the wet and dry season. Laboratory analysis of feed samples taken during visits, every month, was done for dry matter (DM), organic matter (OM), and crude protein (CP) contents. The collected data were analyzed using descriptive statistics.

Results and Discussion

During the survey a total of 1,897 daily rations were observed from which twelve types of feedstuffs were identified in of beef cattle rations. The feedstuffs could be classified into three groups, i.e. green fodders (native grass, elephant grass, maize forages and a minor quantity of tree leaves), crop residues (rice straw, maize leaves and tops, cane leaves and tops, soya straw, and groundnut straw), and concentrate feeds (rice bran, tofu waste, and on-farm mixed concentrate feed). For CP content, crop residues contained the lowest CP ($<$10% in DM basis), with green fodders (10–12% for grasses and 11–25% for tree leaves), concentrate feed (rice bran 9–12%, tofu waste 17–18%, and on farm mixed concentrate 14–16%). Average number of feedstuffs used in daily rations was 1.98 feedstuffs, ranged from 1 (fed as single feed) to 5 feedstuffs (fed as mixed feeds). Crop residues were major feedstuffs used in the rations either in their frequency of use or the amount in the rations. Frequency of crop residues used in the rations was 57.4%, which was higher than those for green fodders (22.8%), and concentrate feed (19.9%). Total OM offered to cattle was 98.7 g/kg $BW^{0.75}$/day, of which crop residues comprised 76.5 g/kg $BW^{0.75}$/day, which was much higher than those for green fodders and concentrate feed (18.7 and 3.5 g/kg $BW^{0.75}$/day, respectively). Out of the frequency and amount of crop residues OM offered to cattle, rice straw comprised the major one, i.e. 31.1% and 42.4 g/kg $BW^{0.75}$/day, respectively, and the rest (26.3% and 34.1 g/kg $BW^{0.75}$/day) was from other crop residues, mainly maize leaves and tops (15.9% and 20.1 g/kg $BW^{0.75}$/day). The frequency of utilization of crop residues, especially rice straw for cattle feeding was higher in the larger and more intensified farms. This was due to lesser forages being available with labor able to collect green forages in respect of number of cattle reared. However, the amount of rice straw offered was lower and the amount of concentrate offered was higher than those in the smaller farmers, as also reported by Zhenhai and Tingshuang (1999). Rice straw is collected during rice harvesting and then stored on farm for a year around period for use as cattle feed. Rice straw is generally fed to cattle without any treatment by small farmers, although some farmers sprayed rice straw with salty water prior to feeding. In larger farmers rice straw is stored and treated with urea or with microbial agents is better than untreated rice straw as reported by Chenost (2000); Sarnklong *et al*. (2009). Utilization of rice straw as a cattle feed is now an integrated part of many agriculture systems in the tropical countries. Farmers used cattle manure as fertilizer for agriculture fields.

Conclusion

Based on this study, it was concluded that because of good availability of crop residues rice straw was a major and more sustainable forage resource for cattle production.

References

Chenost M 2000. Optimizing the use of poor quality roughages through treatments and supplementation in warm climate countries with particular emphasis on urea treatment. Tropical Feeds and Feeding Systems. Retrieved from http://www.fao.org/ag/aga/agap/frg/econf95/PDF/CHENOST.PDF. May 10, 2010.

† E-mail: marjuki4663@yahoo.com

https://doi.org/10.1017/S2040470010000944 Published online by Cambridge University Press

Sarnklong C, Cone JW, Pellikaan W and Hendriks WH 2009. Utilization of rice straw and different treatments to improve its feed value for ruminants: a review. Asian-Australasian Association of Animal Production Societies. Retrieved from http://www.thefreelibrary.com/Utilization+of+rice+straw+and+different+treatments+to+improve+its...-a022531487. May 10, 2010.

Zhenhai Y and Tingshuang G 1999. New developments in livestock systems based on crop residues. Retrieved from http://www.cd3wd.com/cd3wd_40/lstock/003/FeedEconf2/conf96pdf/guo.pdf. May 10, 2010.

doi:10.1017/S2040470010000956

Study on the ensiling effect of *Galega Orientalis* Lam. Cv. Xinyin No.1 treated with different methods

Dong Zhiguo†

Grassland Institute, Xinjiang Academy of Animal Science, Karamay Ave.East No.151, 830000 Urumqi, Xinjiang, China

Introduction

Galega orientalis Lam. cv. Xinyin No. 1 is legume forage which was bred and introduced by the Grassland Institute of Xinjiang Academy of Animal Science. The utilization ratio of its hay is low in the dairy industry farmers prefer silage which avoids losses associated with hay production. However it is difficult to succeed in ensiling this species by routine methods because of the low solubility level of this leguminous forage. This experiment was done to investigate ensiling results using *Galega orientalis* Lam.cv. Xinyin No. 1 with added PFJ.

Material and methods

Test material was the 1st cut of 3-year-growth grass of *Galega orientalis* Lam. cv. Xinyin No. 1, mown in the original florescence. PFJ (Previously fermented juices fermenting) needs to be made in advance before ensiling. Take just the right amount of fresh *Galega orientalis* Lam. cv. Xinyin No. 1 cut it short, crush after adding a little distilled water, get green juice after filtering, then add 0.5% of deoxidation candy, ferment in a hermetic and anaerobium jar under a certain temperature for 2 days, get previously fermented juices and add into the raw material at a 1% rate. The ensiling method was to store silage in a bottle. There were four treatments: new fresh grass ensiled directly, withered grass ensiling, fresh grass adding PFJ and withered grass adding PFJ. Every treatment had three repetitions. The grass of every treatment is cut to 1 cm long, then put into the one litre bottles and pressed tightly. Some raw material grass was dried to check nutrition while making silage. Fresh grass ensiling is: put the grass into the bottles directly after cutting. When adding PFJ to Fresh grass sprinkle 1% PFJ on fresh grass and blend. Withering silage : ensile the grass dried after achieving a flaccid state through exposure to the sun (moisture content about 55%), For Withered grass add PFJ by sprinkling 1% PFJ to the withered grass (moisture content about 55%) and blend equably. After filling was finished, the bottlenecks were completely sealled using the bottle cap and adhesive tape Each bottler was dated. After completing silage, the bottles were placed to store in shade for 50 days then opened for testing.

Results

The difference of CP and NDF contents of silage disposed by half-hay+PFJ is not significant ($P > 0.05$), CP and NDF as contents are merely 4.3% and 0.5% less than raw material respectively, and its NH3-N ($18ug \cdot 100\ ml^{-1}$) and pH (4.4) of silage is lowest in all the treatments. As a result, the fermenting effect of the team half hay + PFJ is best. These results explain that adding PFJ can promote lactic acid needed to ferment so enhancing the fermenting quality of silage and maintaining the nutrient value of *Galega orientalis* Lam. cv. Xinyin No. 1 better.

Table 1 *Comparison on Chemical Composition of Raw Material Grass and Silage %*

	Fresh Grass	Fresh Grass + PFJ	Withering Ensiling	Withered Grass + PFJ
NH_3-N	30^a	28^a	20^b	18^b
pH	5.7^a	5.5^a	4.8^b	4.4^b

† E-mail: dzg_0@sina.com

https://doi.org/10.1017/S2040470010000944 Published online by Cambridge University Press