SHORT COMMUNICATION

ESTIMATING RELATIVE FEED VALUE OF LOCAL *Brachiaria Decumbens*

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ABSTRACT. The main goal of feed analysis is to predict the productive response of animals, in this case ruminant production, when fed diets of a given nutrient composition. A systematic approach to the overall aspects of animal production is vital for a stable and profitable output. Ranking forages can benefit the local producers to value each type of forages they feed the animals. From this point of view, a database must be developed containing sufficient samples of feeds and forages with relevant data determined under relatively uniform conditions, although animal variation due to preference, physiological state or genetic potential for production may, on the other hand, contribute to errors in measurements of forage quality. Relative feed value (RFV) is the forage quality index used widely in the United States as an important tool in the marketing of forages. In Malaysia, however, this index has not been established for assessing the status of local grass quality and how it relates to the performance of the local ruminant industry. The objective of this paper is to estimate RFV of the local *B. decumbens* grass towards the future establishment of its index under tropical climate. RFV between 74-84 obtained from this study was calculated using CP and ME values from a 5-year proximate analysis data from the Department of Veterinary Services (DVS) of local *B. decumbens*, sampled from the southern region of Peninsular Malaysia. If this forage is produced on a large scale, this assessment can help the producers and farmers differentiate between lots that are more or less valuable, thus making it a useful marketing and decision-making tool.

Keywords: relative feed value; *Brachiaria decumbens*

METHOD AND RESULTS

Data compiled from DVS's 5-year proximate analysis results of more than 900 samples of local *B. decumbens* were studied. The samples were collected for the whole year, with slight difference in maturity ages, and mostly sourced from the southern region of Peninsular Malaysia. As the variable climatic conditions played a major role in establishment and yearly forage yields for all of the the grasses within the years, mean percentage values were calculated for crude protein as 12.26%, crude fibre 33.8%, and metabolisable energy 8.69 MJ/kg DM.

Figure 1 shows the trends in RFV, CP and ME of the local *Brachiaria decumbens* sampled. Range of RFV was between 74-84

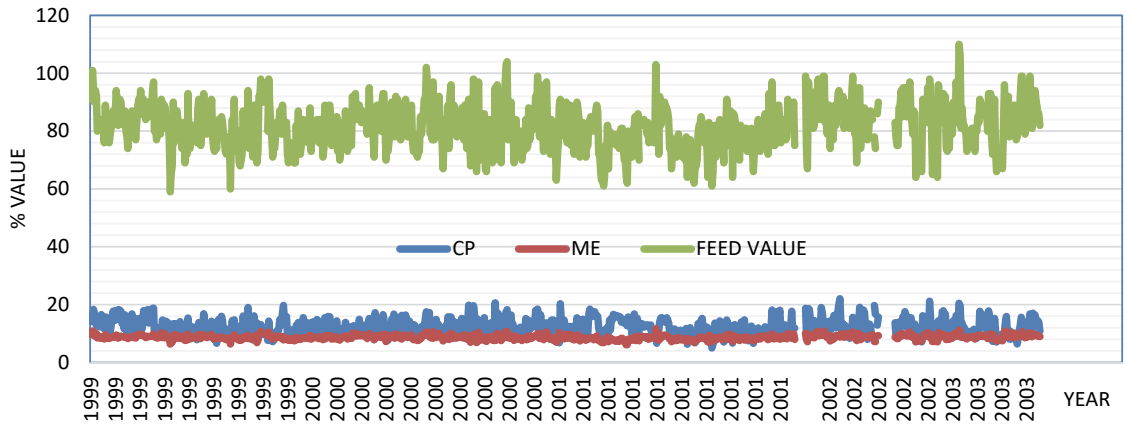

Figure 1. Trends in Relative Feed Value , Crude Protein and Metabolizable Energy of local *B. decumbens* from year 1999-2003.

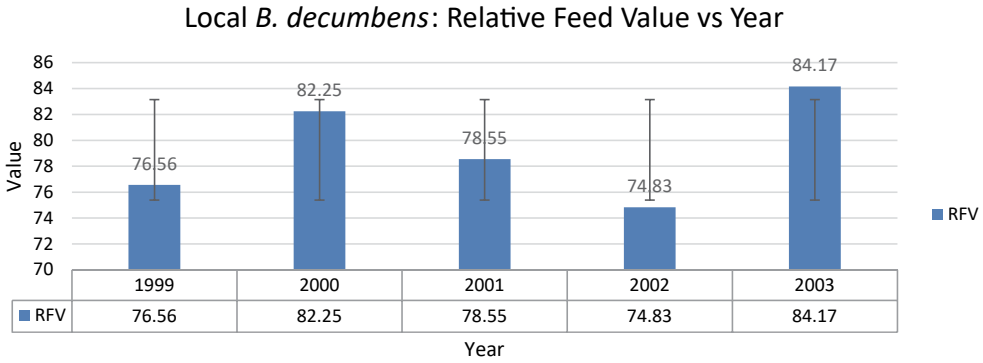

Figure 2. RFV of local *B. decumbens* calculated for each year

in five years between 1999-2003. Average RFV obtained was estimated at 79 (Figure 2). For comparison, for cool season forages in temperate countries, RFV are close to or above 100, a value equivalent to full bloom alfalfa indicating the quality of the forage grasses is sufficient to ensure relatively high intake by livestock. For warm season forages, RFV are all below 100 but above 80.

DISCUSSION

Every pasture is a unique mixture of species differing in forage quality, and this complexity makes it difficult to characterise its nutritive value (Allison, 1985). Variation in livestock performance in pastures is expected to be primarily a manifestation of variation in feed quality and quantity (Cordova *et al.,* 1978). Assessment of forage quality of pastures helps to explain nutritive value and livestock grazing capacity which results from the combined effects of

environmental factors such as type of soil, water availability, climate, altitude (Todorova *et al*., 2002), and management practices (Blackstock et al., 1999).

Brachiaria decumbens also known as signal grass is a highly productive tropical grass that is widespread through South America, Australia, Indonesia, Vanuatu and Malaysia due to its adaptation to a wide range of soil types and environments. The grass is of intermediate to high category in digestibility (50–80%), chemical composition and intake. Its CP ranges from 9% to 20%, but can decline rapidly with the age of leaf, from 10% at 30 days to 5% at 90 days. In Malaysia, *Brachiaria* species have been planted on more than 80% of improved farming pastures with *B. decumbens* as the most favoured species (Chin, 1989). While some other reports claimed that based on estimated nutritive values, animal production from *B. decumbens* pastures would be expected to be comparable to production from other commonly used tropical grass species and from medium quality temperate pastures. This expectation is supported by grazing trials that compared pasture species, composition, stocking rate and growth rates of sheep, goats and cattle; these comparisons showed that daily and annual live weight gains from grazing *B. decumbens* was comparable to or may exceed growth rates on *P. maximum* pastures of 0.46 to 0.78 kg/head/day and 0.49 to 0.61 kg/head/day, respectively (Galgal *et al*., 2000). In some cases, there is a toxicity problem of *B. decumbens* in both sheep and goats, which can cause severe health problems and death (Assumaidaee and Mustapha, 2012).

It is generally accepted that overall ruminant production only plays a minor role in Malaysia. This industry has been based on a low-input low-output system. The industry is growing rather slowly in the 1996-2002 period but began to grow rapidly in 2005-2012 due to the efforts and initiatives of the government. However, the self sufficiency level for ruminant meat is still less than 30% because of high demand and low supply by local producers (Fadhilah, 2015). For decades, the basal feeds for ruminant production in Malaysia are the native grasses and shrubs. These tropical forages, which may also become the sole feed in most ruminant production systems in Malaysia grow to be fibrous earlier and have lower digestibility values as compared with their temperate counterparts. Past experiments showed that nitrogen content of these grasses is just marginally above 1% (Devendra, 1979) and their potential for animal production is low. The net result is poor quality feed. In some situations, for example during dry seasons, supply is insufficient for the animals. However, local grasses and legumes sampled under oil palms were shown to be of better quality, probably benefiting from the large amount of fertilizers regularly applied to the palms. The average nitrogen and energy contents of these native forages are reported to be comparable to those recorded for the introduced tropical grasses and legumes (Liang, 1996). Conflicting data from trials and from on-farm records indicate that nutritive value, as determined by chemical analysis, may not be a true indicator of potential animal performance (Low G.S, 2015).

Several indices of forage quality have been developed over the history of

forage quality evaluation research, example Nutritive Value Index, Digestible Energy Intake, Relative Feed Value, and Quality Index (Moore, 1994). Each index includes both voluntary intake of forage when fed as the sole source of energy and protein, and some measures of available energy, such as energy digestibility, digestible energy, digestible dry matter (DDM) or total digestible nutrients (TDN). Intake of available energy is a major factor affecting animal performance. Relative Feed Value (RFV) is a forage quality index used widely in the United States. It was developed by the Hay Marketing Task Force of the American Forage and Grassland Council (Rohweder *et al*., 1978). Currently, RFV is an important tool in the marketing of forage, and in forage quality education although it is not used for ration formulation. The basis of RFV is the voluntary intake of DDM. Intake of DDM by animals, and thus observed RFV, is determined by two animal responses, dry matter intake (DMI). DMI (% of BW) and DDM concentration (% of DM) are not strongly correlated (Moore and Coleman, 2001). Therefore, RFV is calculated from predicted values for both DMI and DDM based on laboratory analyses for neutral-detergent fiber (NDF) and acid detergent fiber (ADF), respectively.

It is commonly the case that the types of grass grown vary from one region to another. Studies showed that the quality of the grass was generally low with the crude protein content between 5.6% and 15.7% and NDF content of 45.2% to 85.4% (Bakrie, 1996). Based on their digestibility and intake potential, generally the higher the score, the higher would be the quality, but a score of 85-90 is still of high quality for animals fed for maintenance or light production (Putnam, Dan and Steve Orloff, 2003).

From this study, the estimated RFV obtained showed that it was below this score. Since the data collected were under a tropical climate, two factors need to be considered. Firstly, the fibre characteristics that differ among forage species and it cannot be compared with alfalfa due to their difference in developmental stages. Grass has more fibre than alfalfa, which lowers its RFV. This could also be the the reason why RFV in this study fluctuated inconsistently each year. Secondly, differences in the digestibility of the fibre fraction can result in differences in animal performance when forages with a similar RFV index are fed (Jeranyama and Garcia, 2004)

RFV is used to compare similar forages for two important qualities: how well it will be consumed and how well it will be digested. Although RFV can provide a general idea about forage quality, and certain limitation of predictions with cool-season species, it does not give an estimate of how closely the forage will satisfy an animal's nutrient requirements. Researchers in this field of study should, therefore, not only measure the product's output in isolation when carrying out their research, but should work together with extension personnel and farmers to formulate acceptable feeding systems under their respective production environments. Further studies should be conducted to make proper corrections and assessment regarding the estimated index values obtained from this study, with an expectation of its potential use to categorize grass species into low, moderate and high feedstuffs.

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