A REVIEW OF FIFTEEN YEARS ANNUAL STATISTIC OF FORAGE SAMPLES RECEIVED AT ANIMAL FEED LABORATORY, IVM.

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The Animal Feed Laboratory, Institut Veterinar Malaysia (IVM) of the Department Of Veterinary Services is responsible for feeding stuffs analysis in the southern region of Peninsular Malaysia. During the last 15 years, forage analysis has become a routine activity of the laboratory because of increased awareness and technology application in the ruminant industries. IVM laboratory refers forages as plants or plant parts other than grains fed to or grazed by domestic animals. Forage may be fresh, dry or ensiled (e.g. pasture, green chop, hay and silage) and forage quality refers to the ability of forage to support desired levels of animal performance (e.g. daily gain or milk production). IVM laboratory have evaluate forage by using proximate analysis (dry matter, crude protein, ether extract, ash and crude fibre) and from the analysis, the proximate system estimate nitrogen free extract and total digestible energy. This paper describes the annual statistics of forage samples and provides some nutritive value of forage samples analyzed by Animal Feed Laboratory.

A total of 10,338 forage samples were submitted to Animal Feed Laboratory, IVM from 2000 to 2014. The samples were recorded, analyzed and the results were collated in PROX system. Crude protein content (N x 6.25) was determined by the Kjeldahl method, crude fiber was measured using Fibertec method (FOSS) and ether extract was measured using Soxtec method (FOSS). Other parameters in proximate analysis were determined according to Association of Official Analytical Chemists, AOAC (2000). Total digestible nutrient was calculated using Manke equation (Davendra, 1979). Calcium values were obtained by using an atomic absorption spectrophotometer and phosphorus values by a spectrophotometer.

The highest percentage of forage samples analyzed over the total number of feedstuffs received was 77% in 2001 and lowest was 35% in 2010. Between 2001 and 2014 more than 50% of the samples received were forage samples ranging from 50% in 2009 to 77% in 2002, the number of samples analyzed by the laboratory increased from 2003 until 2013. The increase in the number of samples per year meant that there was an increase in the use of chemicals, energy and time. Alternative procedures are therefore required to perform the analysis faster and more accurately. Near Infrared (NIR) test method is a more recent technological advancement which uses light to more quickly determine the nutritive value. The big advantage of NIR is speed (10 to 15 minutes rather than the several days required for wet chemistry) and is less expensive (no sample preparation other than drying and grinding).

Table 1 lists the nutrient content of some forage samples commonly received by IVM Laboratory. Nutritive contents are normally reported on dry matter (DM) basis because it contains all of the important nutrients. This is the nutrient content of the feed if all water was removed and this makes it easy to compare feeds and evaluate their nutrient composition (Hall *et al.* 2009). Total digestible nutrient is important to measure of the energy value in a feedstuff. Generally moderate to high crude protein is desirable since it

can reduce supplemental protein. Laboratory analysis also shows that early cut forage with a high percentage of leaves with additional legumes has high crude protein content.

Table 1: Nutrient content of some foragereceived to Animal Feed Laboratory

Forages	% Dry matter	% TDN	% CP	% EE	Ca, % DM	P, % DM
(Leaves)						
Mallotus barbatus (Balik angin)	40.3	73.1	16.4	7.9	1.24	0.47
Morus (Mulberry)	26.0	69.5	28.7	2.1	1.13	0.29
Sorghum vulgare (Sekoi)	94.7	59.3	15.8	2.4	0.32	0.24
Syzygium inophylla (Gelam tikus)	66.5	64.3	6.2	7.3	0.47	0.23
(Silage)						
Panicum maximum (Rumput kuda)	37.3	50.9	6.1	1.4	0.41	0.13
(Hay)						
Leucaena leucocephala	89.4	78.0	31.2	2.8	0.88	0.20
Br. decumben	81.3	59.9	9.1	1.2	0.32	0.13
Br. ruziziensis	92.5	51.8	4.7	0.8	0.57	0.09
Medicago sativa	88.9	54.0	16.9	1.5	1.00	0.22
Oryza sativa	87.5	46.6	6.2	0.7	0.19	0.18
Pennisetum purpureum	81.1	57.6	14.2	1.8	0.34	0.34

Laboratory analysis showed that nutrient content in forage was not consistent. The inconsistency with a wide range of nutritional values in forages may be due to geographic location, environment (temperature, humidity and precipitation), types of grass and/or legume, and grazing management (fertilization, effect by other grass). To ensure that nutrient needs of the farm's animal groups are met, it is important to test forages periodically. According to Flack and Hoffman (2013) there are at least six situations that need forages testing - before they are fed, throughout the year when a change in the forage or in production is noted, from pastures when there are noticeable changes in seasons or weather patterns, from purchased forages if the growing or harvesting conditions are not known, if growing new forage crops or unique combinations of forage crops and when there are few reference values available.

Forage quality is highly variable among and within forage types and therefore nutrient content of the forage (especially silage and hay) must be monitored regularly because of its wide use as animal feed and will impact the livestock industry. This situation will affect livestock farmers to obtain a balanced diet to get good livestock production. The largest operating cost in a livestock production enterprise is the feed price. To maintain feed cost low, farmers must supply the right amount of feed to the animals. Overfeeding is wasteful and underfeeding will decrease animal performance and profitability. Nutrient analysis of forage is necessary for accurately balancing rations and figuring lowest costs. Farmers must be aware that proper animal feeding and nutrition are crucial to the profitability of the livestock enterprise.

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