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Analysis of Proximate Principles of Feeds and Fodders

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A B S T R A C T

The jowarkadbi, soybean straw, napier and concentrate mixture were containing on an average 90.23, 87.62, 29.75, 91.12 per cent DM, respectively. The CP content 3.74, 6.13, 5.77, 17.34 per cent respectively. The chemical composition indicated that soybean straw contained more protein and crude fibre than that of jowarkadbi.

Introduction

India is an agricultural country and livestock plays an important role in Indian agriculture. Animal Husbandry forms the backbone of rural economy and also it has been understood that of the total cost of milk production (70percent) is attributed to feeding alone.

Balanced feeding is another necessity. It has been observed that animal in certain region are suffering from various mineral disease. These are instances, where animal do not grow and perform well even after feeding the adequately due to nutritional imbalance. Therefore it is beneficial to analyze available feed and fodder and prepare a feed schedule, balancing the entire beneficial nutrient. Effort in planned feeding of the animals will not only enhance the production and profit but also reduce feed shortage.

The result of the present study will definitely helpful for judicious feeding to the animal on one hand and maintaining their productivity on other hand. Considering this aspect it seen necessary to utilize the fodder resources.

Materials and Methods

The present investigation was undertaken at Livestock Instructional Farm, of Animal Husbandry and Dairy Scince Department of Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola during the year 2015-2016. Jowarkadbi, Soybean straw, hybrid Napier as green fodder and Sugras dry ration as concentrate mixture were analysed.

Dry matter, crude protein, crude fiber, nitrogen free extract and total ash were determined as per procedure given in Bureaus of Indian standard (1990).

Dry matter

The dry matter percentage was determine as per the procedure recommended by BIS, IS: 7874(part-I)-1975.

Weighted accurately 100 g of the feed and fodder in to aluminum dish. Heated the dish containing the material in hot air oven maintained at 100-120^{0}C for about 3 hours cooled it and weighted with the cover on. Repeated the process of drying cooling and weighting at 30 minutes intervals for appropriate reading.

$$\text{Moisture percent by weight} = \frac{100\ (W_1\text{-}W_2)}{W_1\text{-}W_2}$$

Dry matter (%) = Weight of sample - weight of moisture in sample

Where,

W_1 = Weight of gram of the dish with feed before drying

W_2 = Weight in gram of the dish with feed after drying

Crude protein

Nitrogen percentage was estimated by Kjeldahl's method as per the procedure recommended by BIS, IS: 7475(part I)-1975 and crude protein percentage was calculated by multiplying the percentage of total nitrogen by 6.25. After determining the moisture content, the oven dried sample was ground and further processed for chemical analysis. Weighed 10 g of sample was transferred to the Kjeldahl's flask. About 10 g of potassium sulphate and 0.5 g of copper sulphate were added to flask 25 ml of concentrated sulphuric acid was added. The flask was plays on digestion chamber and heated gently to boil until contents were clear and allowed the liquid to cool and diluted with 200 ml of distilled until all ammonia was passed over and was received over standard sulphuric acid which was then back titrated with standard NaOH in order to determine the amount of standard acid used to neutralize the ammonia evolved from digested material. Similarly bland sample was run.

$$\text{Total nitrogen (\%)} = \frac{1.4\ (B\text{-}A)\ N}{W}$$

Total protein = total nitrogen X 6.25

Where,

B = Volume of N/10 NaOH for blank
A = Volume of N/10 NaOH used for sample
N = Normality of standard NaOH
W =Weight of sample in g

Crude fiber

Crude fiber percentage will be determined as per the procedure recommended by BIS, IS: 7874(part)-1975.

After determining ether, the oven dried sample was ground 10 g of sample was transferred into a flask and boiled with 1.25% sulphuric acid 1.25% sodium hydroxide for half an hour. Then left residue was dried, weighted and ignited. Loss in weight was taken as fiber contents of the sample.

Total ash

Total ash was estimated as per the procedure recommended by BIS, IS: 7874(part I) -1975.

The empty and dried silica crucible was weighed. Accurately 10 g of feed sample was taken. The sample was evaporated to dryness on a hot plate. The crucible was placed in a pre-heated Muffle furnace and heated the contents at 550-600^{0}C until ash was free carbon. The crucible was cooled by placing in desiccators.

Percent ash by weight = B/A X 100

Where,

A = Weight of feed sample
B = Weight of ash

Nitrogen free extract

NFE was estimated as per the BIS, IS: 7874 (part I)-1975.

The sum of all (i.e. Moisture Crude Fiber, Ether Extract and Total Ash) was subtracted from the percentage of total nutrients.

Nitrogen free extract (%) = 100 – (A+ B+C+ D+E)

Where,

A = Moisture content (%)
B = Crude Protein (%)
C = Ether extract (%)
D = Crude fiber (%)
E = Ash content (%)

Results and Discussion

From the Table it was observed that jowarkadbi, soybean straw, hybrid Napier and concentrate were containing 90.23, 87.62, 29.75 and 91.12 DM respectively. The jowarkadbi was containing 3.74, 2.84, 51.52, 32.48 and 9.42 per cent CP, EE, NFE, CF and ash while soybean straw was containing 6.13, 2.51, 37.29, 44.21, 9.86 per cent, CP, EE, NFE, CF and ash respectively. The contents of nutrients in hybrid Napier was 5.77, 2.50, 49.22, 26.28 and 16.23 per cent CP, FE, NFE, CF and Ash. Similarly the contents of nutrient in concentrate were 17.34, 5.27, 61.74, 11.84 and 3.81 per cent CP, EE, NFE, CF and ash.

The chemical composition reported by Jhori *et al.,* (1971), Pachauri and Negi (1976) and Gupta *et al.,* (1978) for soybean straw are in the line with the present values. They reported protein value from 4.90 to 6.58%**.** The present value falls between the reported values. The variation in the protein content of the straw might be on account of incorporation of cut and low graded soybean grains during threshing process and the proportion of the grains would influenced the CP content of the by products.

The most significant finding was that soybean straw twice rich as that of jowar in respect of CP content. Similarly, CF was higher in soybean straw than that of jowarkadbi, whereas NFE, EE and Ash were higher in jowarkadbi, over soybean straw.

Chemical composition of jowarkadbi is nearer with that of reported by Ibrahim *et al.,* (1998). They also observed that the content of CP, CF, EE and NFE in jowarkadbi as 4.04, 37.34, 2.40 and 4.55 per cent respectively, slightly lower values of CP and CF, but the values of EE and NFE are in line with present value. The difference in value of CP and CF is due to change in variety, soil climatic condition and harvesting time of jowar. Similar observations were also noted by kamble (2006) and Bansod (2008).

Moreover Gampawar and Zinzarde (1992) noted change in the composition of jowar at different maturity stage, CP being highest at boost stage followed by 50% flowering stage (7.20%) and milky stage (4.40%) these observations support the present trend in respect of proximate principle of jowarkadbi.

Plate 1: Feed stuff

Chemical composition of feed stuffs (on % DM)

Particulars	Jowarkadbi	Soybean Straw	Hybrid Napier (Green fodder)	Concentrate (Sugras dry ration)
DM	90.23	87.62	29.75	91.12
CP	3.74	6.13	5.77	17.34
EE	2.84	2.51	2.50	5.27
NFE	51.52	37.29	49.22	61.74
CF	32.48	44.21	26.28	11.84
Total Ash	9.42	9.86	16.23	3.81

Green Hybrid Napier contained 29.75% DM Along with 5.77, 2.50, 49.22, 26.28 and 16.23 per cent CP, FE, NFE, CF and total Ash on dry matter basis, respectively. The present CP values are nearer with the composition reported by Talpada (1978) as 5.89%, Parnekar *et al.*, (1985) as 4.30%, Bansod (2008) as 5.77% and Kumaresan and Parthasarathy (2008) 7.8% are substantially higher than the present value.

Higher or lower CP content in hybrid Napier as 13.5% reported by Balaraman (1995), which appears to be substantially higher than the present value.

Higher or lower CP content in Hybrid Napier might be on account of differences in the variety and stage of harvesting according to Reddy and Reddy (1986). The noted further the increase in the content of DM, CF, Lignin and Silica to the extent of 40 to 46% and decrease in CP level by 60% at 14 to 15 weeks harvest stage in comparison to 8 to 9 weeks harvest stage.

Concentrate mixtures, a product of Maharashtra Agro Industries Development Corporation MAIDC, under the trade name "Sugras" was containing 18.45 and 11.18 % CP and CF on DM basis, respectively. Moreover the past workers like Bohra *et al.*, (1987), Puri and Gupta (2001) and Gupta and Murdia (2006) also suggested feeding of higher CP level concentrates (19.5 to 19.8 %) while rearing animals on ammonia treated paddy and wheat straw. Kamble (2006) and Adangale *et al.*, (2009) reported the CP content of Sugras between 17.34 to 19.17 % which is comparable with present results.

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