PROXIMATE COMPOSITION OF RED FINGER MILLET VARIETY

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Abstract
The aim of determining the proximate analysis of red finger millet/*Tamba* (*Eleusine coracana*) was to ascertain its nutritional composition and its ability to be used as feed ingredient. Proximate analysis of red finger millet was carried out at the biochemistry laboratory of the department of Animal Science, Ahmadu Bello University, Zaria. The result of the analysis revealed that it contained Dry Matter-88.48; Crude Protein (CP)-13.98; Ether Extract (EE)-3.70; Crude Fiber (CF)-6.67; Ash-4.90; Nitrogen Free Extract (NFE)-59.22. Therefore, it can be concluded that finger millet is a nutritious feed resource and can be incorporated into animal feed. It is recommended for farmers to use it by incorporating it into livestock feed because of the prospects it has shown in the proximate analysis result.

Key words: Finger millet, Proximate, Feed resource, Analysis, Nutrients

Introduction

The term millet is derived from the French word "mille'' which means thousand, with a handful of millet containing up to 1000 grains (Shahidi and Chandrasekara, 2013). *Eleusine coracana* is called *kpana* by the Beroms, *tamba* in Hausa (Fernandez *et al.*, 2003). Millet belongs to the group of small seeded species of cereal crops or grains which are annual plants (Shiihii *et al*., 2011). The grain belongs to the family Poaceae which originated in Ethiopia and the sub-family *Chloridodeae* (Pradeep&Sreerama, 2015; Sood *et al*., 2016; Ramashia *et al*., 2018). The brown cultivar is utilized for brewing traditional opaque beer in Southern Africa (Sood *et al*., 2017). The grain is a semi-arid region crop cultivated in dry areas with limited rainfall and can adapt to various agro-climatic conditions (Gull *et al*., 2014). Hence, it is important to look at ways of how to economically and effectively substitute some of the conventional feed resources since they are becoming scarce and beyond the reach of the small and medium entrepreneur farmers. Hence, the proximate analysis to find out the nutritional contents of red/brown finger millet so that farmers can be encouraged to adopt its usage.

Materials and method

Source of finger millet

The grain which is popularly called finger millet or *tamba* locally was purchased from Ganawuri local market located in Riyom local Government Area of Plateau State and Manchok in Kaduna State.

Determination of finger millet proximate composition

The proximate composition of finger millet was carried out at the biochemistry laboratory of the department of Animal Science, Ahmadu Bello University, Zaria, Kaduna State, Nigeria. The analysis was carried out according to the standard method of (AOAC, 2005).

Results and Discussion

The proximate analysis results obtained for red finger millet revealed that it had a crude protein of 13.98%, The value obtained here is higher than 9.1g/100g recorded byRavishankar *et al*., (2003); D'Andrea *et al.* (1999) who reported 7.3%; Chethan and Malleshi, (2007) 5-8%, Gull *et al.,* (2015), Gupta *et al.*, (2011) 7.5 – 9.56, brown/red 8.7 g /100 g (Rao, 1994) for other members of the millet family, such as foxtail millet (10.29%), burnyard millet 6.93% (Verma *et al*., 2014), These differences could be due to the variations experienced in geographical locations and soils where the finger millet was planted or the amount of rainfall in those areas. Therefore, this high CP of red finger millet makes it a very nutritionally important ingredient for animal feed, since protein is very vital for normal functioning of the entire body system. Proteins are essential components of the diet needed for survival of animals and humans; their basic function in nutrition is to supply adequate amount of required amino acids (Pugalenthi *et al*., 2004).

The ether extract or crude fat obtained from the analysis of red finger millet revealed that it had 3.70%. This is higher than what was reported by Ravishankar *et al*., (2003) 1.2g/100g, David *et al*., (2014) 0.83%, 1-2% (Chethan and Malleshi, 2007), 1.3-1.8% (Bhatt *et al*., 2003; Lupien, 1990). However, it is comparable to what was obtained 2.1% (Anthony *et al*., 1996).The differences and variations seen may be as a result of different methods of laboratory analysis by different laboratory personnel that carried out the analysis. High fat ingredients are suggested for inclusion in weight gaining diets because of the energy embedded in them. Leeson, (1997) reported that fats are widely used energy sources in addition to improving the consistency and palatability of mash feed.

The result of the proximate analysis revealed Ash content of 4.90% for red finger millet, this is higher than what was reported by David *et al*., (2014) 2.37%; 1.7% (Rao, 1994). The differences recorded may be due to the different types of fertilizer used and the methods of application found in those areas. This suggests that red finger millet has more content of inorganic or mineral in it. This result agrees with what was reported by Singh and Raghuvanshi, (2012) that the Ash content in finger millet is higher than what was obtained in the commonly used cereal grains.

The result of crude fiber showed that Red finger millet had 6.67%, This is higher than what was reported in foxtail millet 4.25% and burnyard millet 2.98% (Verma *et al*., 2014); 72% obtained by D'Andrea *et al* (1999). These wide variations could be as a result of using different cultivars on different soils with various rainfalls ranges, probably the stage of maturity at which the crop was harvested. Crude fiber is nutritionally important as it aids the absorption of trace elements in the gut and elimination of undigested waste through the bowel (Abolaji *et al*., 2007).

The nitrogen free extract (NFE) obtained from the result revealed that red finger millet had 59.22% which is lower than 72% obtained by D'Andrea *et al* (1999); 77.9g/100g (Ravishankar *et al*., 2003). These wide variations could be as a result of using different cultivars on different soils with various rainfalls.

Table 1: Proximate composition Finger millet (*Eleusinecoracana)*(%)

Parameter	**Composition**	
	Red colour	**Black colour**
Dry matter	88.48	87.55
Crude protein	13.98	13.14
`Ether extract	3.70	3.10
Crude fiber	6.67	7.02
Ash	4.90	4.36
Nitrogen Free Extract	59.22	59.84

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