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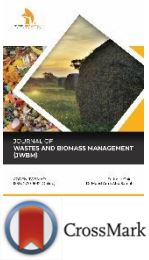

RESEARCH ARTICLE

ASSESSMENT OF THE NUTRITIVE VALUE OF CASHEW PULP WITH WHEAT OFFAL AS ABSORBENT (CpWO) AS FEEDSTUFF FOR LIVESTOCK

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ABSTRACT

Cashew (Anacardium occidentale) is one of the indigenous bioresources in Ogbomoso, Oyo State, Nigeria. Cashew pulp is about 5-10 times the size of the nuts or nearly 90% of cashew Less than 10% of it is utilized in Nigeria while the rest is left to rot on the farm during its season, thereby increasing environmental pollution. Therefore, a study was conducted to develop simple method for converting cashew pulp (Cp) into animal feed using wheat offal (WO) as an absorbent at ratio (Cp:WO) 1:1 and subsequently sun-dried for 3 days. The proximate analysis and anti-nutritional factor of processed cashew pulp with wheat offal as absorbent (CpWO) showed that it contained 5.28%, 94.72%, 24.02%, 5.93%, 53.41%, 1.42%, 5.22% and 89.50% for Moisture content (MC), Dry matter (DM), Crude protein (CP), Crude fibre (CF), Nitrogen-free extract (NFE), Ether extract (EE), Ash content, and Organic matter (OM), respectively while the anti-nutritional factor contained 12.22%, 6.21%, 7.33%, 7.34mg/100g, 6.56mg/100g, 3.21mg/kg, 82.39mg/g and 14.58mg/g of Saponin, Alkaloid, Flavonoids, Tannin, Polyphenol, Cyanide, Phytate and Oxalate. The results obtained from this study showed that cashew pulp with wheat offal as absorbent (CpWO) could be used as an alternative feedstuff in the diet of livestock..

KEYWORDS

Cashew pulp, wheat offal, absorbent, feedstuff, livestock

1. INTRODUCTION

Constant feed supply and ever increasing cost of conventional feedstuffs such as maize due to competition between man and livestock for grains is the major constraint in livestock production (Amefule et al., 2004; Obun et al., 2010). This necessitated constant research on underutilized indigenous bioresources, household waste and agro-industrial waste as alternative feedstuffs, which can be incorporated in feed of livestock at lower cost and utilized mostly during dry season when there is poor quantity and quality of forages. One of such agro-industrial by-products is cashew pulp which is mostly dumped and pollutes the environment (Ahaotu et al., 2013; Ominiski et al., 2021).

Cashew (Anacardium occidentale) is an indigenous bioresources in Ogbomoso, Oyo State, Nigeria. The pulp is nearly 90% of cashew and it is about 6-9 cm long with a smooth, shiny skin that turns from green to bright red, orange or yellow in color at maturity (Ahaotu and Ihekoronye, 2019; Filgueiras et al., 1999). The underutilization of the pulps in Nigeria can constitute pollutants when left to rot on the farm (Oduwole et al., 2001; Joseph et al., 2020). Cashew pulp as indigenous bioresources can be processed into feedstuff with required nutrients for alleviating some of the global problems facing livestock production by improving the performance of livestock, converting waste to wealth, reducing cost of production and creating job opportunity. Unconventional feedstuff such as cashew pulp can be processed into feed ingredient rich in nutrients by mixing it with wheat offal as absorbent and serve as good alternative to maize/corn bran and other feed constituents that compete with human for food (Wadhwa et al., 2015; Olosunde et al., 2023). Thus, this study sought to evaluate the potential of cashew pulp with wheat offal as absorbent (CpWO) as a non-conventional feedstuff for livestock.

2. MATERIALS AND METHODS

2.1 Study area

The experiment was carried out at the rabbit section of the Bioresources Development Centre (BIODEC) Ogbomoso, Oyo State.

2.2 Processing of CpWO and Chemical Analysis

Early in the morning, dropped ripe Cashew fruits were picked up under the cashew trees at Bioresources Development Centre, Ogbomoso. The pulps were collected into empty 20 litres bucket and weighed after the removal of nuts. Grinding and mixing of the cashew pulp thoroughly with wheat offal at ratio 1:1 by hand was done until the fluid from Cp was not superfluous and sun-dried for 3 days (Makinde and Sonaiya, 2007). Sun drying was be done on black polythene sheets (0.7 mm thickness) spread thinly on concrete floor. Samples were analyzed for proximate composition, anti-nutritional factors, minerals and vitamin A and C. Proximate composition was analyzed using the methods of AOAC (2000).

3. RESULTS

The chemical composition of CpWO is shown in Table 1. The values obtained for CpWO in this study were 94.72% DM, 24.02% CP, 5.93% CF, 1.42% EE, 53.41% NFE, 89.50% OM and 5.22% ash. Table 2 shows the mineral and vitamin composition of CpWO.

Table 3 shows the antinutritional factors in the CpWO. The values of saponin, alkaloid, flavonoid, tannin, polyphenol, cyanide, phytate and oxalate were 12.22%, 6.21%, 7.33%, 0.00743%, 0.00656%, 3.21ppm,

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8.239% and 1.458%, respectively.

Table 1: Chemical composition of CpWO

Parameter	CpWO
Dry matter	94.72
Analysis % of DM	
Crude protein	24.02
Crude fibre	5.93
Ether extract	1.42
Nitrogen free extract	53.41
Organic matter	89.50
Ash	5.22

CpWO: Cashew pulp with Wheat Offal as absorbent

Table 2: Mineral and Vitamin Composition of CpWO

Minerals (mg/100g)	CpWO
Calcium	2.33
Magnesium	1.40
Potassium	31.45
Sodium	12.18
Iron	1.80
Zinc	1.20
Copper	0.12
Manganese	0.20
Vitamin	
Vitamin A (mg/l)	332.40
Vitamin C (g/ml)	2.23

CpWO: Cashew pulp with Wheat Offal as absorbent

Table 3: Antinutritional factors in CpWO

Parameter	CpWO
Saponin (%)	12.22
Alkaliod (%)	6.21
Flavonoid (%)	7.33
Tannin (mg/100g)	7.34
Polyphenol (mg/100g)	6.56
Cyanide (mg/kg)	3.21
Phytate (mg/g)	82.39
Oxalate (mg/g)	14.58

CpWO: Cashew pulp with Wheat Offal as absorbent

4. Discussion

The lower moisture content of (5.28%) favored the storage of CpWO since high moisture content support microbial growth and spoilage of feedstuff, moisture content greater than 12% is undesirable for good keeping quality of feed ingredients (Afoloyan et al., 2019; Rozis, 1997). The values of dry matter, crude protein, crude fibre and ash of CpWO were higher than the values of dry matter (88.75%), crude protein (8.92%), crude fibre (1.93%) and ash (1.90%) reported by (Ahaotu and Ihekoronye, 2019). The crude protein content of CpWO is higher than 9.8% and 8.75% for maize reported by (Abiose and Ikujenlola, 2014; Ape et al. 2016). CpWO can be used to replace conventional feed ingredient such as maize at graded levels due to the rich chemical composition.

The values obtained for CpWO were higher than the dry matter, crude protein, crude fibre and ash of fresh cashew apple reported by, sun-dried cashew waste (CAW), dehydrated cashew apple meal (DCAM), dried cashew pulp (DCP), dried cashew apple meal (DCAM) reported by most of researchers, respectively (Castillo and Gerpacio, 2005; Fanimo et al., 2003; Gomes et al., 2018; Ahaotu and Ihekoronye, 2019: Boateng et al., 2021). A group researcher reported higher values for crude fibre and ether extract (Okpanachi et al., 2016). A group researchers reported lower dry matter, crude protein and ash content of cashew apple waste (CAW) (Adebowale et al., 2021). The authors reported higher crude fibre content of 9.71%. The differences in the values could be due to different methods of processing cashew pulp into feedstuff. CpWO could be incorporated in the feed of livestock as protein supplement. The nutrient contents of CpWO agreed with the report of that cashew apple or pulp is a rich source of essential nutrients (Deckers et al., 2001).

The calcium, magnesium, potassium and sodium content of CpWO were lower than the values in sun-dried cashew pulp reported (Okpanachi et al., 2018). The authors reported 0.11% and 0.14% Mg, 1.08% and 0.91% K, 0.07% and 0.06% Na, 0.15% and 0.18 % Ca for sun-dried red and yellow varieties of cashew pulp, respectively. The CpWO values for calcium, potassium and sodium from this study were lower than 0.72% Ca, 1.65% K and 0.56% Na of dried cashew pulp reported (Ahaotu et al., 2018). The variation could be due to different methods of processing used, harvesting season of the fruit, agronomic practices, mineral content of the soil, mineral content, and ripening stage of the cashew pulps. This result is in line with the reports that cashew pulp is rich in minerals and vitamins (Ahaotu and Ihkoronye, 2019; Deckers et al., 2001; Okpanachi et al., 2018).

The saponin content of CpWO is in line with the report that there are about 10% saponins in fruit pulp (Du et al., 2015). The result showed that all the phytonutrients analysed are present in CpWO at different levels of intensity. The values of saponin, flavonoid, phytate and oxalate in this study for CpWO were higher than the values reported by Okpanachi et al., 2016 for sun-dried red and yellow varieties of cashew pulp. Tannin range between 1%-2% has adverse effect on non-ruminant and the value 0.00743% of tannin in this study was lower than the toxic level that can affect livestock negatively (Price and Butler, 1980). The adverse effects of high levels of some of the antinutritional factors in CpWO can be reduced by incorporating in the feed of livestock at graded levels to replace conventional feedstuff.

5. Conclusion

The results obtained from this study showed that CpWO have good nutrient and mineral potentials to serve as source of protein, minerals in animal feeds. It could be concluded that cashew pulp with wheat offal as absorbent could be used as an alternative feedstuff in the diet of livestock. The non-conventional feedstuff (CpWO) developed can be incorporated in the feed of livestock at graded levels to determine its effect on the performance of livestock.

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