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Nutrient Composition of Cassava Offals and Cassava Sievates Collected from Locations in Edo State, Nigeria

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Abstract: The investigation was carried out to determine the chemical composition of cassava offals and cassava sievates collected from 5 locations in Edo State, Nigeria. Following sun-drying (30-35^{o}C), the cassava by-products were analyzed for protein, fibre, carbohydrate, cyanide, ash and fat. The results revealed that the DM for the sievates ranged between 87.06 and 91.88%; (P (1.02 - 1.07%); EE (0.50 - 0.84%); and CF (3.01 - 3.25%). Others were ash (between 1.74 and 2.01%), Carbohydrate (47.20 - 66.00%) and cyanide between 1.24 and 1.63mg/kg. In addition, those for the cassava offals were between 1.72 and 2.21%CP; 0.48 - 0.85%EE; 1.26 - 3.20% CF; starch (between 70.50 and 77.52%) and cyanide (0.97 - 1.20mg/kg). Thus, indicating variations with respect to location in most cases.

Key words: Nutrient composition, cassava sievates, cassava offals, Nigeria

Introduction

Cassava (*Manihot spp)* is a widely cultivated staple crop in the tropics (Oyenuga, 1968) wherein Nigeria is located. According to FAO World Food Perspective report submitted to PANA, it was stated that Nigeria in leading the African countries produced 26.0 million tuber tones out of the continents 72.7 million tuber tones and world's figure of 158.1 million tuber tones of cassava.

The two major waste products of cassava processing in Nigeria are cassava sievates (a Product from garri manufacture) and cassava offals (Waste from fufu production). Despite the abundance of these wastes, information on their nutrients composition are virtually non existent.

Thus, the study was undertaken to determine the nutrient composition of these cassava waste products collected from five processing locations in Edo State, a part of Midwestern Nigeria.

Materials and Methods

The cassava sievates and cassava offals used for this study (see Fig. 1 and 2 for derivation methods) were collected from five locations (Ugbowo, Ekenwan, Ehor, Abudu and Ikpoba Hill) in Edo State, Nigeria. Five sampling were undertaken, and the materials were sun dried (30 - 35^{o}C), milled and packed in special polythene sheets. Thereafter, they were analyzed for the crude protein, fibre, carbohydrate, ash and fat according to the AOAC (1990) procedures and cyanide as Modified (Bradbury *et al.,* 1991).

The pooled data were subjected to analysis of variance and significance between means (Steel and Torrie, 1980) were separated using Duncan's multiple range test.

Results

The results of the chemical composition of cassava sievates are presented in Table 1. The aim of the investigation was to ascertain the proximate composition of the cassava wastes for a consequent development as livestock feed resources. Results show that ether extract, ash, carbohydrate and cyanide concentration of the cassava sievates were only significantly ($P<0.05$) affected by sampling locations. The values indicated that DM for the sievates (Table 1) ranged between 87 and 92% after sun-drying. In addition, the percentage proteins were about 1.0. Although the ether extract fraction were less than one percent, it however showed that it varied between 0.5 percent in location one and 0.8 percent in locations 2 and 4, Ash (about 2%) and carbohydrate fraction, between 47 percent (location 4) and 66% in the third location. The fibre fractions were between 1.0 and 3.0 percent.

Also, the analytical values for the cyanide (mg/kg) ranged between 1.24 and 1.63 (Table 1).

The proximate composition of the cassava offals are shown in Table 2. Results indicated that they were not significantly ($P>0.05$) affected (except CF and Ash fraction) by place of sampling. The percentage crude protein and starch were higher than that of the cassava sievates while, the crude fibre, ash and cyanide contents were lower. The starch fraction ranged between 70.5 and 77.52, cyanide (between 0.97 and 1.20mg/kg) and crude protein (1.72 - 2.21 percent).

Discussion

The study was to ascertain the composition of cassava

Table 1: Nutritional and Cyanide Composition of Cassava Sievates Collected from five locations in Edo State, Nigeria

Nutrient	Locations					
	1	2	3	4	5	Mean±SEM[1]
Dry matter (%)	90.55	88.53	87.19	87.06	91.88	1.895
Crude protein (%)	1.06	1.02	1.07	1.05	1.04	0.017
Ether extract (%)	0.494[a]	0.808[b]	0.676[c]	0.838[b]	0.528[a]	0.140
Crude fibre (%)	3.01	3.22	3.01	3.25	3.01	1.285
Ash (%)	2.01[a]	1.79[b]	1.74[b]	1.89[c]	1.95[ab]	1.07
Carbohydrate (%)	64.00[a]	48.60[b]	66.00[a]	47.20[b]	62.00[c]	8.000
Cyanide (mg/kg)	1.24[a]	1.62[b]	1.41[c]	1,63[b]	1.34[d]	0.154

[abcd]Means on the same row with different superscript are significantly (P<0.05) different.
Locations: 1, Ugbowo; 2, Ekehuan; 3, Ehor; 4, Abudu; 5, Ikpoba hill.

Table 2: Nutritional and Cyanide Composition of Cassava Offals Collected from five locations in Edo State Nigeria

Nutrient	Locations					
	1	2	3	4	5	Mean±SEM[1]
Dry matter (%)	85.02	83.50	83.50	83.36	84.44	0.0654
Crude protein (%)	2.21	1.85	1.72	1.88	2.00	0.165
Ether extract (%)	0.48	0.58	0.85	1.52	0.67	0.371
Crude fibre (%)	1.82[a]	2.54[a]	1.26[c]	3.20[b]	2.88[b]	0.708
Ash (%)	2.22[a]	1.54[bc]	2.10[a]	1.82[b]	1.42[c]	3.309
Starch (%)	76.10	70.50	71.80	77.52	75.85	2.709
Cyanide (mg/kg)	1.02	1.20	1.01	0.97	0.98	0.084

[abc]Means on the same row with different superscript are significantly (P<0.05) different.

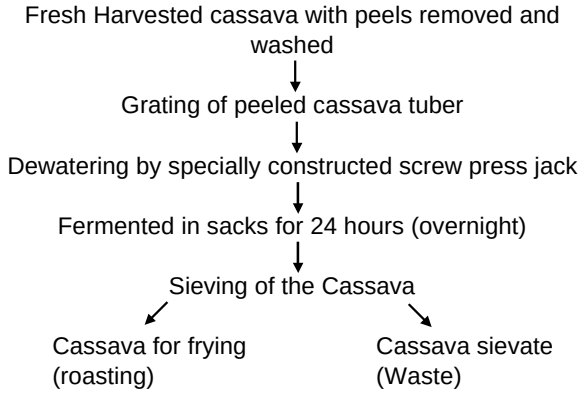

Fig. 1: Procedure for production of cassava sievate

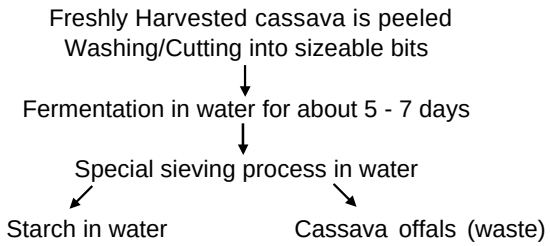

Fig. 2: Derivation procedure for Cassava offals

sievates and cassava offals as well as the influence of location on these nutrients. The slight or marked variations reported may be due to cassava sources including location, cultural practices during production, soil types or a combination of two or more of these factors (Jackson *et al*., 1992; Tewe and Egbunike, 1992; Wood, 1992) and processing methods (Hahn, 1989; Westby and Twiddy, 1992; Fish and Trim, 1993; Ingram, 1975). The high DM levels for the products (sievate and offals) may not be unconnected with the stage at which they were obtained. Similarly, since the carbohydrate fraction is high for both cases with very low fibre levels, this might be indicative that these products if properly developed may be useful for livestock feeding especially for monogastrics (Tewe, 1994; Iyayi and Tewe, 1994).

The cyanide levels obtained for both cassava sievates and cassava offals in this investigations were very low. Probable reason apart from processing, parts of the tubers which constitute the products, the analytical methods may also have contributed (Bokanga *et al*., 1994) as the latter were reported to affect cyanogenic glucosides of cassava. However, these cyanide contents obtained were lower than reported optimal level of safety for man and livestock (Osuntokum, 1970; Oke, 1978; Tewe and Maner, 1981; Dufour, 1988; Jackson *et al*., 1992).

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