



Nutritive Values of Fruits and Seeds Usually Eaten Raw in Nigeria

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ABSTRACT: The nutritive values of some fruits and seeds usually eaten raw in Nigeria have been studied. These include avocado pear (*Persea amaricana*), pawpaw (*Garcine papaya*), Banana (*Musa sapientum*), Coconut (*Cocos nucifera*), Bitter Kola (*Garcine kola*), Black tamarind (*Dalilium guineensis*), Mango (*Mangifera indica*) and Garsen egg (*Solanum melongena*). The fruits showed appreciable amounts of moisture; pawpaw ($80.24 \pm 4.20\%$), garden egg ($73.46 \pm 3.15\%$), banana ($68.84 \pm 3.14\%$) and avocado pear (66.36 ± 3.20) in decreasing content. Only avocado and coconut had high fat content with values of $30.27 \pm 1.20\%$ and $18.05 \pm 2.50\%$ respectively on a dry weight basis. The protein content of all the fruits and seeds were not high; the highest value of $3.00 \pm 0.21\%$ was obtained for coconut. Appreciable amounts of calcium and vitamins C ($13.80 \pm 210\%$ and $7.19 \pm 0.14\%$) respectively have been obtained from fruit some of the seeds. The carbohydrate content (expressed as glucose) of the fruits and seeds also gave values ranging from $2.97 \pm 0.02\%$ to $4.00 \pm 0.10\%$. The results show that these fruits and seeds eaten raw are good sources of essential nutrients particularly Vitamin C which is destroyed by high temperature during preparation. @JASEM

Adequate nutrition depends on the ingestion of foods that will supply normal quantities of nutrients and when insufficient quantity of foods are ingested or food is inadequately digested and utilized, malnutrition occurs. (Cetz, 1988). Fruits and seeds are very important in nutrients. (Ihekoronye and Ngoddy, 1985).

MATERIALS AND METHODS

Fruits and seeds were bought from a local market (mile 1 market) in Port Harcourt, Rivers State of Nigeria. The various nutrients were analyzed accordingly to the Soxhlet method (Bulan et al, 1976). Crude protein determination employed the Kjeldahl Markham's method (1942).

Carbohydrate (expressed as glucose) was determined using the method of Dotti et al, (1971). Good eating habits are the best defense open to the ordinary man and woman against disease and the best assurance of a long, active and virile life and for a healthy and tranquil old age (Hawthorn, 1981). Nigerians had for long cultivated the habit of eating some of their fruits and seeds raw. It thus becomes necessary that a study on the nutrient composition (nutritive value) of some of these will help to recommend them as useful regular sources of good nutrients for good health. Visual titration method of Chapman, (1951) was used to determine the ascorbic (Vitamin C) content. Ashing in a muffle furnace at 600°C for 8 hours gave the ash content by difference in weight and calcium determination was by the method of Cockerell (1975) based on chemical method of analysis.

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RESULTS AND DISCUSSION

Table 1 shows a summary of the chemical composition of some fruits and seeds usually eaten raw in Nigeria. The protein content of all the fruits and seeds were not high; the highest value of 3.00% was obtained for coconut. Appreciable amounts of calcium and vitamin C can be obtained from the fruits and some of the seeds. The carbohydrate content (expressed as glucose) of the fruits and seeds also gave measurable values. The results show that these fruits and seeds eaten raw are good sources of essential nutrients particularly vitamin C which is destroyed by high temperatures during preparation. All the fruits were high in their amount of moisture. Such high moisture contents in fruits have been reported earlier; infact most fruits contain 75% moisture or more and the seeds having much less moisture (Hawthorn, 1981). The high moisture content in fruits provides part of the medium for normal functioning of enzymes and general metabolic processes.

The fat content of coconut was quite high, followed by avocado pear; others had minor traces of fat. This actually supports an earlier report, which says that apart from nuts and one or two other crops, fruits and vegetables contain only minor traces of fats (Maltram, 1979). Infact earlier reports have given the same high trend for avocado and low trend for banana, pawpaw and mango (Ihekoronye and Ngoddy, 1985).

The crude protein content showed generally low values. Fruits have previously been reported to provide comparatively little energy or protein (Hawthorn, 1981). Alternatively, fish, most egg and seafoods are the notable sources of high quality protein (Passmore et al., 1975).

TABLE 1: Chemical Composition of some Fruits and Seeds Usually eaten Raw in Nigeria

Samples	% Moisture	% Protein	% Ash	% Calcium	% ClO	% Fat	Vitamin C mg/100g
Avocado pear	66.4 ± 3.2	2.2 ± 0.1	2.8 ± 0.05	13.9 ± 2.1	2.9 ± 0.1	18.1 ± 1.2	3.4 ± 1.0
Garden egg	73.5 ± 3.2	1.7 ± 0.1	0.98 ± 0.01	4.7 ± 0.01	2.8 ± 0.01	1.2 ± 0.03	6.5 ± 1.2
Banana	68.8 ± 3.1	1.1 ± 0.01	5.5 ± 0.1	8.0 ± 0.2	6.4 ± 0.1	0.9 ± 0.01	9.9 ± 1.5
Coconut	53.4 ± 2.8	3.0 ± 0.2	2.9 ± 0.1	19.30 ± 0.2	2.1 ± 0.1	30.2 ± 2.5	2.1 ± 0.4
Pawpaw	81.9 ± 4.2	0.8 ± 0.01	2.9 ± 0.02	1.38 ± 0.02	9.9 ± 1.2	0.12 ± 0.01	87.7 ± 4.5
Black Tamad	35.5 ± 1.5	1.3 ± 0.03	1.8 ± 0.1	13.55 ± 0.3	3.8 ± 0.3	0.2 ± 0.01	1.8 ± 0.1
Bitter	41.2 ± 2.1	1.1 ± 0.05	3.4 ± 0.1	13.80 ± 2.1	4.0 ± 0.9	4.3 ± 1.2	7.2 ± 0.1

Values are means ± standard Deviation of Triplicate Determinations .

Fruits, vegetables and seeds provide the extras by way of minerals and vitamins, which help to balance dietary requirements (Hobinson et al . 1972). This agrees with results in Table 1. similar results have infact been reported earlier (Oyenuga, 1968). Calcium is very essential for proper bone formation and vitamin c which was predominant in pawpaw and mango is very widely distributed among fresh fruits (Mottram, 1976) . Vitamin C is especially subject to destruction at elevated temperatures under conditions that permit free access to atmospheric oxygen (Ihekoroye and Ngoddy, 1985) and is decreased in canning and drying of fruits and vegetables (Mottram 1979) . It then becomes logical that these fruits and seeds eaten raw provide more of this vitamin than the prepared forms (processed or cooked foods). The quantity of carbohydrate in fruits varies with the stage of ripening. During ripening in most fruit almost all the starch is converted to simple sugar, infact most fruits contain 3-15% carbohydrate present as simple sugars in the ripe state (Mottram, 1979). The results got for carbohydrates (as glucose) fall within this range with pawpaw having the highest value of 9.96%.

In conclusion, the habit of eating some of these fruits and seeds raw by Nigerians has some nutritional advantages and should be encouraged.

REFERENCES

Chapman, DC; Rochon C and Cambell JA (1951). Estimation of Ascorbic acid in Pharmaceutical Interfering Substances; Anal. Chem 23: 113.

Dolti, LB; James OM. (1971); Dinitro Salicyolic acid reagent for glucose determination. In Laboratory Instructions in Biochemistry ; 8th ed. 19164: the C.V. Mosby Company, Saint Louis.

Gpoetz, PW. (1988). The New Encyclopaedia Britanica Encyclopaedia Britanica, Inc. Vol. 25: 49, 57-70, 7: 741, 19: 336.

Hawthorn, J. (1981). Foundations of food; WH. Freeman and Company (Oxford and Sam Francisco) 8-17, 135, 147, 149.

Hulan. HW Hynsakar, WA.: Kramer J. KG. and Manderam determination Cand J. phys. Pharm 54:7.

Ihekoronye, AI And Ngoddy PO.(1985). Food Science and Technology for the Tropics. Macmillian publishers, London and Basignstoke 293, 311. 106, 108, 127, 130, 194 -200.

Markham R. (1942). A steam distillation apparatus suitable for micro-Kjeldahi analysis. Biochem. J. 36: 170.

Onyenuga, VA. (1968). Nigeria's foods and feeding stuff, Ibandan University press, University of Ibadan . Ibandan, 22, 26, 56, 53 55, 90 -33.

Passmore. DS. Truswell, and Brock, JF (1975). Human Nutrition and Dietetics, Longman Group Limited 227 -243.

Robinson, RJK; Larken, F; Candretto AM; Tadayyon, BT (1972). 'Malnutrition' - it's causation and control (Vol.2) V Cardin and Breach Science Pub. Lnc. 316, 317.

Udoh, CK (1985). The components of Food and Their Classification; In Nutrition. Macmillan International College Editions. 3-86.