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DETERMINATION OF POTASSIUM, SODIUM, CHLORIDE, NITRITE, AND NITRATE IN ROASTED PLANTAIN SOLD IN OZORO

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Abstract:

Roasted plantains are ready to eat foods prepared mainly and sold by vendors and hawkers in the street and other similar public places A research to investigate the physicochemical assessment of roadside roasted plantain sold openly and freely in different locations in Ozoro, Delta State was analyzed. Sixteen (16) samples were analyzed. The physicochemical parameters analyzed were Potassium, Sodium, Chloride, Nitrite, and Nitrate. Potassium in samples A ranges from 0.74mg/l to 0.790mg/l while for samples B it ranges from 0.633mg/ml to 0.857mg/l. Sodium in samples A ranges from1.031mg/l to 1.059mg/l while for samples B it ranges from 0.608mg/l to 0.875mg/l. Chloride in samples A ranges from 1.402mg/l to1.457mg/l while for samples B it ranges from 0.620mg/l to 0.976mg/l. Nitrite in samples A ranges from 1.523mg/l to1.649mg/l while for samples B it ranges from 0.520mg/l to 1.2586mg/l. Nitrate in samples A ranges from 0.670mg/l to0.763mg/l while for samples B it ranges from 0.509mg/l to 1.0306mg/l. Nitrite has a leading value than other chemical value. This can be due to post production or heat applied to samples.

Key words: Potassium, Sodium, Chloride, Nitrite, Nitrate, Roasted, Plantain

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INTRODUCTION:

Plantains are members of the banana species called *Musa* known as platanos which are treated as vegetable in the kitchen and are mostly widely grown in tropical climates (Valmayor *et al.,* 2000). Plantain is seed plants that have a botanical name called *Musa Paradisiaca*, (Oxford dictionary online, 2010). Plantain is a general term embracing a number of species or hybrids in the genus *Musa,* family *Musceae*. It has lower sugar content than other plant group like banana; and has more starch (Jennifer, 2014).

Plantain is found in tropical region; it is monocarpic, flowering and setting fruit once before it dies. Plantain is a perennial herbaceous plant that develops from the underground rhizome. At maturity, the rhizomes gives rise to flower (inflorescences) that is carried up along its smooth, elongated, unbranched stem, piercing through the center of pseudo-stem, finally emerging out of the top in between its leafy clusters. The flower eventually develops into a bunch, consisting of 3 to 20 hands, with each group holding at least 5 to 10 fingers (fruits). Plantains grow best in areas with constant warm temperature and protection from strong winds and it was discovered in western Caribbean (India). Plantains undergo asexual reproduction and it is 1 to 12 feet long while the stalk is 50 to 100cm (along).

The plantain fruit (ripe and unripe) especially the ripped one may be eaten raw or parboiled or roasted. Ripe plantain can be pulped for puree for in a variety of products including plantain chips, dodo, baby food yoghurt, boli (roasted plantain) (Redhead, 1989).

Plantain can also be dried and ground into flour, beverages which can be made from fermented ripe plantain. The plantain leaves are not eaten but may be used for wrapping food in cooling (Dole food Company, 2002). The plantain foliage and pseudostems are used as cattle feed during dry periods in some plantain producing areas. The plantain can also be dried and eaten as amala.

In Nigeria, West Africa, it is common practice to eat roasted plantain without being mindful of the health implications from the environment where it is prepared or roasted. Heavy metals for instance, are known to have several adverse effect on human that consume these as food such as lead, Zinc, Calcium, etc, has a particular effect on human. For instance; lead on human causes metabolic poison which accumulate in body tissue such as red blood cell, liver and kidney which may lead to metal fume fever, file cutter disease, depression and behavioral disorder (Forastieric, 1997). Zinc also causes metal fume fever in man. This is characterized by pulmonary manifestations which may lead to fever chills, severe anaemia, vomiting, abdominal pain etc. (Walsh, *et al.,*1994)

MATERIALS AND METHOD:

STUDY SIZE

The samples used for this experiment work are sixteen (16) which were collected from different vending points in Ozoro town

CHEMICAL DETERMINATION

a. Determination of chloride content
b. Determination of potassium content
c. Determination of sodium content
d. Determination of nitrate content.
e. Determination of nitrite content.

Procedure:

The chloride, potassium, sodium, nitrite and nitrate content was carried out using spectrophotometer method, the procedure involves preparing a blank (deionized water) for the zeroing of the spectrophotometer. A standard was prepare (a known concentration of chloride, potassium, sodium, nitrite and nitrate) while the samples to analyze are the unknown. The blank, standard and sample was poured into three different corvettes each. The blank was placed inside the first corvette compartment, follow to standard in the next compartment and the samples were placed on the third corvette compartment. The chloride content was displayed in digital form and was recorded. The same procedure was repeated for potassium, sodium, nitrite, and nitrate respectively

RESULT AND DISCUSSION:

TABLE 1: Chemical Analysis Result

	SAMPLE A								SAMPLE B							
PARAMETERS	**1A**	**A2**	**A3**	**A4**	**A5**	**A6**	**A7**	**A8**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**
potassium	0.782	0.780	0.74	0.778	0.760	0.770	0.790	0.796	0.633	0.857	0.645	0.786	0.838	0.679	0.840	0.798
sodium	1.031	1.059	1.040	1.039	1.056	1.038	1.042	1.048	0.608	0.875	0.786	0.679	0.870	0.789	0.842	0.865
chloride	1.439	1.457	1.402	1.440	1.437	1..430.	1.450	1.456	0.976	0.661	0.960	0.908	0.736	0.620	0.687	0.920
nitrite	1.530	1.642	1.528	1.523	1.640	1.529	1.649	1.629	0.533	1.258	0.529	0.520	1.239	1.220	0.530	0.525
nitrate	0.670	0.763	0.750	0.761	0.763	0.759	0.761	0.760	0.510	1. 030	0.520	0.590	1. 020	1.018	1.029	0.509

DISCUSSION:

Table 1 shows the results obtained from the analysis of sample A and sample B. the chemicals analyzed were Potassium, Sodium, Chloride, Nitrate and Nitrite.

From the samples analyzed sample in sample A, A3 has the least Potassium of 0.74mg/l while A7 has the highest of 0.790mg/l. for samples B; sample B1 has the lowest Potassium of 0.633mg/l while sample B2 has the highest of 0.857mg/l.

For Sodium, sample A, A1 has the lowest Sodium content of 1.031mg/l while sample A2 has the highest of 1.059mg/l. samples B, B1 has the lowest Sodium of 0.608mg/l while B2 has the highest sodium of 0.875mg/l.

For Chloride, sample A, A3 has the lowest Chloride content of 1.402mg/l while sample A2 has the highest of 1.457mg/l. samples B, B6 has the lowest Chloride of 0.620mg/l while B1 has the highest Chloride of 0.976mg/l.

For Nitrite, sample A, A4 has the lowest Nitrite content of 1.523mg/l while sample A7 has the highest of 1.649mg/l. samples B, B4 has the lowest Nitrite of 0.520mg/l while B2 has the highest nitrite of 1.258mg/l.

For Nitrate, sample A, A1 has the lowest nitrate content of 0.670mg/l while sample A2 and A5 have the highest of 0.763mg/l. samples B, B8 has the lowest Nitrate of 0.509mg/l while B2 has the highest Nitrate of 1.030mg/l.

The result obtained in this study from chemicals determination in roasted plantain is not expected. This could be due to the excessive heating of food sample.

Heavy metals for instance, are known to have several adverse effect on human that consume these as food such as lead, Zinc, Calcium, etc, has a particular effect on human. For instance; lead on human cause's metabolic poison which accumulate in body tissue such as red blood cell, liver and kidney which may lead to metal fume fever, file cutter disease, depression, and behavioral disorder (Forastieric, 1997).

CONCLUSION AND RECOMMENDATION:

CONCLUSION

The excessive intake of roadside roasted plantain above the normal or expected level may lead to complication in the body chemistry.

RECOMMENDATION

It is recommended that Training on hygiene and sanitation of food handlers on regular basis for carriers, the establishment of code of practice for the street food industry and provision of basic water and waste management utilities to diminish the gap between knowledge and practices of roasted plantain.

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