

Analysis of the Sensory Attributes Of Plantain Wine: An Alternative to Imported Wines in Nigeria

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ABSTRACT

This study was carried out at School of Agriculture, Lagos State Polytechnic and the data were analyzed at Statistics department, The Polytechnic, Ibadan.

Plantain is locally available all year round especially during the period of November – February. There is over supply of it to the extent of some getting over-ripe and are wasted. Yet, the over-ripe one could be utilized for the production of wine. The alcoholic content of such a wine is adjustable to individual requirement.

Respondents for the microbial analysis of the product were drawn from Ikorodu and South West of Ibadan areas. The study tends to conclude that the wine can complete favourably with foreign wines. It can be taken by both the young and old, during meals and even at parties or special occasions. The product over-all can be said to have passed the consumers' assessment in terms of the attributed consideration. The result showed that the respondents are from South West areas of Nigeria. It is thus expected that the other consumers in this population will react in the same way as the respondents to the product.

The acceptability of the production in the society is therefore not in doubt and the results from this study can be used to allay public fear of its safety and to enhance the acceptability of the product. It is recommended from the analysis of variance table that further research work should be carried out using other local materials as flavour to preserve the wine in order to reduce importation of wine and also promote economic growth and development.

Keywords: Plantain wine, Sensory attributes, Analysis, respondents.

INTRODUCTION:

The use of local materials in the production of wine or drinks on a health and large scale bases has been relegated to the background in the Nigerian economy. It has been left mostly in the informal sector with small scale local producers under unhygienic conditions that could endanger the health of the consumers of the product. There is a general patronage of foreign wine. This drains the foreign reserves of the nation and impacts negatively on the balance of trade. Import substitution through the production of wine using local materials can be a way-out of this economic problem.

Hence, an alternative drink, which can be produced by making use of local materials, is advocated. This will generate employment and income for the economic agent that may be involved in its production and consumption. Steinkraus, (1995).

Plantain is a common and highly nutritious plant that can be processed into such a drink due to its high sugar content. Cousin and Durkan (1982) explained wines as old as history.

The Assyrians, the Greek, German, Halian, Spaniards and the French all established vineyards for the cultivation of grapes used in wine making (David et al; 1980).

Wine is an alcoholic beverage obtained from fermentation of freshly gathered fruits e.g. grapes plantain and etc, these fermented juice were extracted from fruits (Areola et al 2011).

Foreign wine got into Nigeria with the coming of the Europeans, before the advent of foreign wine, local wine particularly palm wine tapped from the palm tree and found mostly in the Southern part of Nigeria. Burukutu or Pito, a local brew fermented from guinea corn was found mostly in the north central state of Nigeria. These brews preceded the modern breweries such as Nigerian Breweries Plc that bottled Star, Gulder e.t.c, Consolidated Brewery Plc bottled 33 and Asokoro that bottled Trophy and other distilleries and wineries.

Palm wine is the Africa alcohol table wine. It is obtained from the palm tree. Palm sap is a sweet colour liquid containing about 10 to 12% fermentable sugar and neutral in reaction (Okafor, 1975, Steinkraus 1979 and Fafunso 2000).

Palm wine is heavy milk white opalescent suspension of live yeast and bacteria with a sweet taste and vigorous effervescence consumed throughout the tropics.

Plantain Drink – An Alternative

Virtually all sugary plant sap can be processed into an alcoholic beverage. Plantain is rich in sugar. Hence, it can be processed into wine. The origin of plantain is still uncertain and shrouded in controversy among researchers and taxonomists, Simmond 1966, noted that a remarkable density of it exists in Central Africa. Chessman 1948, asserted that the movement of plantain was from India to East Africa from where it spread to Central and West Africa. At least 116 plantain cultivators have been identified in West and Central Africa (Akoroda, 2008). The size and bunch types of plantain are the most important characteristics for production purpose (Ogagi, 1980).

Plantain can be stored in an unripe condition and ripening can be induced more or at least will be by suitable control of storage condition. The storage span of plantain can also be extended by packing it in sealed bags with ethylene absorbent. The purpose of using polythene bags is to maintain high humidity. Plantain in addition to being a very nutritious and valuable food has been found to have a high medicinal value (Akinyele, 2004).

Derivations of plantain are used by tradomedical practitioners in the treatment of diarrhea, gonorrhoea, vomiting, sore throat e.t.c. (Steinkraus, 2002).

OBJECTIVES OF THE STUDY

The main objectives of this study are to process plantain into wine and assess the acceptability of the product to potential consumers in South Western Nigeria.

The specific objectives include:

- Prepare plantain wine.
- Carryout a sensory test on the products through potential consumers.
- Determine the acceptability of the products by the potential consumers.

- Make policy recommendations based on the findings of this study.

Table 1: The Nutritional Components and Values of Nutrients in Plantain

Nutrients	Weight/stick/finger
Water	67g
Calories	128g
Protein	1.0g
Carbohydrates	31g
Calcium	20g
Vitamin A	150g
Nicotinamede	0.4g
Ascorbic Acid	8g
Fat	0.2g
Fibre	0.3g
Iron	0.5g
Thiamine	0.03g
Riboflavin	0.03g
Waste	72g

Source: Oyenuga, 1980

Schematic Flow of the preparation of plantain wine:

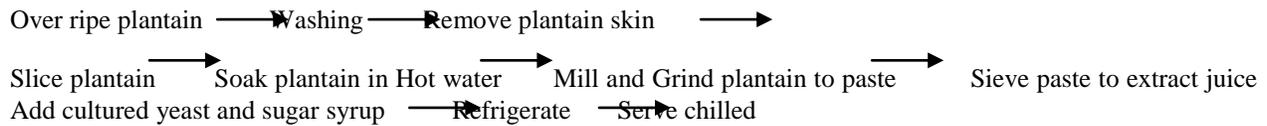


Figure 1: Scheme of preparation (Odunfa, 1988)

These diagrams can be summarized into four steps.

- a. Wash, peel and slice plantain
- b. Allow to soak for 3-4 days
- c. Extract the juice from paste by sieving
- d. Chill or serve. It is however better to chill to have a refreshing drink

WORKING HYPOTHESIS

$$H_0: X_1 = X_2 = X_3 = X_4 = X_5$$

That the sensory attributes have no significant effect on the means of the respondents' scores i.e. there is no significant difference among the means of the scores for the characteristics or that the columns means are the same.

$$H_1: X_1 \neq X_2 \neq X_3 \neq X_4 \neq X_5$$

That there is significant difference among the means, of the scores; by the respondents for the characteristics or that the means are not the same. The focus of this hypothesis is to examine the influence of the attributes on the means of the scores by the respondents. In other words, do the attributes have any effect on the results? An acceptance of H_0 implies that they have no effect and the results are statistically invalid and not acceptable.

However, an acceptance of H_1 indicates that the attributes have significant influence on the outcome of the analysis.

Area of study

Ikorodu and parts of Ibadan South West of Nigeria were used as the sampling frame for this study. The respondents were randomly selected. These two areas present a good representation of South West part of Nigeria (Lagos and Oyo states).

The targeted respondents cut across the population strata i.e. men, women, young, old, educated, partially educated and artisans. This is to provide a broad base for the subsequent analysis.

Method of Data Collection

The instruments used include oral interview and sensory evaluation format on the respondents.

The product was well labeled as sample A. It was presented in a bottle with glass cup to each respondent to taste. The sensory evaluation forms were also distributed as questionnaire. The respondents were given the grading system of 1 to 6. With 1 = very poor, 2 = poor, 3 = fair, 4 = good, 5 = very good and 6 = excellent. They were instructed to score the characteristics which are appearance, colour, taste, aroma and the acceptability of the product on this scale.

The different and respective scores for the characteristics were analyzed using ANOVA and descriptive statistics.

Results:

Table 2: Mean and S.D of the scores

Response	Appearance	Colour	Taste	Aroma	Accept
Total	470	430	490	420	480
Mean	4.7	4.3	4.9	4.2	4.8
SD	0.68	0.95	1.10	0.63	1.03
C.V.%	14.5	22.1	22.5	15.0	21.5

Source: Areola and Salawu, 2012

ND: C.V, = (SD X 100) / Mean.

Table 2 shows the total distribution of the sources by the respondents for the different attributes of the product considered. The means range between 4.2 for aroma and 4.0 for taste. The standard deviation range between 0.63 for aroma and 1.10 for taste. The degree of dispersion in the scores for the different characteristics of the product is examined by using the coefficient of variation (CV).

The values of the CV range between 14.5% for appearance and 22.5% for taste. The implication of this findings is that the means are representative of the respective distribution of scores for the characteristics. The values thus cluster round or are very near the means. There is no wide dispersion in the distribution of the scores.

The scores are thus statistically, reasonably and closely distributed.

Table 3: Distribution of Respondent by their scores for the characteristics of the product

Remarks	Grades	App.	Colour	Taste	Aroma	Acceptability
Excellent	6	10	10	40	-	30
V.Good	5	50	30	20	30	30
Good	4	40	40	30	60	30
Fair	3	-	20	10	10	10
Poor	2	-	-	-	-	-
V.poor	1	-	-	-	-	-
Total	-	100	100	100	100	100

Source: Areola and Salawu 2012.

In Table 3, the study revealed that none of the respondents scored the product poor or very poor.

Twenty of the respondents scored it fair for colour and ten respondent grades it fair for taste, aroma and acceptability. However, the result tends to indicate that all the respondents (100) or 100% grade it good to excellent for appearance. On colour, 80% of the respondents scored it good to excellent. For taste, aroma and acceptability, 90 respondents or 90% of them graded the product good to excellent.

The implication of this result is that majority of the respondents with at least 80% for colour, 90% for taste, aroma and acceptability, and 100% for appearance, highly recommended the product for consumption based on their sensory evaluation.

The product over-all can be said to have passed the consumers' assessment in terms of these attributes. Hence, it can be deemed to be a satisfactory alternative and acceptable product to the respondent.

Table 4: Results of the Analysis of Variance (ANOVA) for the Respondents.

Source of variation	SS	Df	MS	F _{cal}	α	F _{critical}
Between groups	3.88	4	0.97	1.2024	0.05	2.5787
Within Groups	36.30	45	0.8076		5%	
Total	40.19	49				

Source: Field Survey 2012

The F- tabulated or critical at 2.5787 is greater than the F-statistic of 1.2024 at the 5% level of significance. This Criterion rule indicates the acceptance of the null hypothesis (H_0) and the rejection of the alternative hypothesis (H_1). There is no significant difference among the means by the attributed. The respondents are from the same zone of Nigeria population. It is thus expected that the other elements/consumers in this population will react in the same way as the respondents to the product. The acceptability of the product in the society is therefore not in doubt. The decision rules used are (i) if $F_{cal} > F_{tab}$, reject H_0 and accept H_1 , there is a significant difference among the means and (ii) if $F_{cal} < F_{tab}$, accept H_0 and reject H_1 . There is no significant difference among means. The results from this study can be used to allay public fear of its safety and to enhance the acceptability of the product just like palm wine.

Conclusion:

The results of the study have been discussed. The findings have been highlighted. It is hoped that they will be useful to other researchers as well as policy makers for the formulation of policy on micro-enterprises in the two states and Nigeria in general.

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