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AN ANALYSIS OF DETERMINANTS OF CONSUMPTION OF FERMENTED TRADITIONAL DRINKS IN KWARA STATE, NIGERIA

SUMMARY

Given the vital contributions of traditional food processing techniques to rural development and sustainable national development, this study examined consumers' awareness of benefits, consumption and determinants of consumption of *kunun-zaki, pito, soborodo, ogi*, and *nunu*, which are examples of fermented traditional food drinks in Kwara State, Nigeria. For the study, 165 respondents were stratified, and randomly selected across socioeconomic strata of farmers, students and civil servants in the study area. Descriptive statistics and the Binary Logistic model (BLR) were used to analyse the data. Findings indicated that awareness of the nutritional benefits of the drink is relatively high (75%) and frequency of consumption highest at 2-3 times in a week (60%). This implies a favourable disposition towards the drink which could lead to eventual demand of this food drinks category. Similarly, the probability of consumption was influenced by the availability of the drinks (p=0.1) and assurance of safety relating to the processing of these drinks categories (p=0.1). Based on these findings, the study recommends that issues relating to safety assurance of how the food drinks are processed be addressed by concerned food regulatory agencies and the formulation of appropriate strategies by marketing agents that would enhance the availability and acceptability of the products by consumers.

Keywords: Traditional food beverage, consumer acceptability, and marketing.

INTRODUCTION

Sustainable rural development is closely linked with the promotion of small-scale food industries that involve lower capital investment and rely on traditional food processing technologies. By generating employment opportunities in the rural areas, small-scale food industries reduce rural-urban migration and the associated social problems. They are vital to reducing post-harvest food losses and increasing food availability. It is clear from experiences with large, fully mechanized processing plants in Nigeria and other West African countries, that small-scale food industries, involving limited mechanization of the traditional methods of food processing, with possibilities for replication in the rural areas where the raw materials are produced, offers better prospects for success. Indeed, simple, low-cost, traditional food processing techniques are the

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bedrock of small-scale food processing enterprises in West Africa and their contributions to the economy are enormous (Robertson and Lupien, 2008).

With a reawakening of interest among Nigerians on the consumption of traditional non-alcoholic beverages (Adeyemi and Umar, 1994 and recognition of the vital roles it play, the drinks are now consumed for their thirst-quenching properties, nutritional and medicinal stimulating effects and for ceremonial rites (Osuntogun and Aboaba, 2004; Onyelucheya N.E., *et al.*, 2001). Many types of traditional processed beverages are available in Nigeria but only a few like *kunun-zaki, pito, soborodo, ogi*, and *nunu* are more popular. The transformation of these traditionally processed beverages is done through microbial fermentation. Food fermentation is regarded as one of the oldest ways of food processing and preservation. More than anything else, man has known the use of microbes for preparation of food products for thousands of years and all over the world a wide range of fermented foods and beverages contributed significantly to the diets of many people. In traditional fermented food preparation, microbes are used to prepare and preserve food products, adding to their nutritive value, the flavour and other qualities associated with edibility (Achi, 2005). These processes are characterized by their limited need for energy input, allowing microbial fermentations to proceed without external heat sources.

Although fermented foods traditionally have constituted a significant proportion of our diet, Nigerians have exhibited an ambivalent attitude in terms of consumers' taste and preferences for it. Most of the available beverages in Nigerian markets are either imported or produced under a franchise agreement with foreign-based multi-national companies. The multi-nationals own rights to formulae and trademarks, and supply semi-finished products with instructions to indigenous bottlers who merely install the plant, produce according to specifications and market the products (Ogundiwin and Omobuwajo, 1990; Omobuwajo, 1993; and Omobuwajo, 1998). A large percentage of the profit in the lucrative beverage industry thus accrues to foreign partners.

However, with the increasing urbanization and demand for beverage drinks and greater emphasis on the sustainable agriculture transformation agenda through the value chain approach in Nigeria, there is a need to quantitatively examine the factors and patterns of consumption of some selected traditionally processed non-alcoholic beverages among respondents in Kwara state, Nigeria. This is done with a view to examine the level of awareness and consumption of the drinks by consumers and ascertain the possibility of demand for the locally produced beverages. Specifically, the study selected *kunun, pito, soborodo, ogi (pap),* and *fura-de- nunu* which are all examples of traditionally processed and non-alcoholic food drink and;

-Examines respondents' knowledge of types and perceived benefits of these traditionally-processed non-alcoholic beverages, and,

-Ascertains the determinants and frequency of consumption of these traditionally-processed non-alcoholic beverages.

To the best of our knowledge, study of this kind will contribute to the body of literature on consumption analysis of traditionally processed Agri-food by conducting a quantitative assessment drawn from in depth survey of representative socioeconomic strata. It would equally aid in the development of appropriate technologies and policy formulation aimed at upgrading the quality of indigenous Nigeria foods which are *sine qua non* to the sustainable growth, development and survival of the Agri-food industry.

MATERIAL AND METHODS

The study was conducted in Ilorin, Kwara State, Nigeria. Kwara State is located in the North-Central geographical zone of Nigeria within latitudes $7^0$45N and $9^0$30N and longitudes $2^0$30E and $6^0$25E (Wikipedia, 2012). It covers a total land area of about 36,825 square kilometers and shares boundary with Ondo, Oyo, Osun, Niger and Kogi States in Nigeria and an international border with the republic of Benin along its north-western part (KWSEEDS, 2004). The town is relatively urban, the people cosmopolitan and consequently, of various socio-economic strata (KWSEEDS, 2004).

This study used an adaptive stratified sampling technique to select the study respondents. This is done with a view to representing the major socio-economic strata of farmers, government workers, students in the study area. Purposively, the study sampled the strata of students, government workers, commercial workers/traders, and agricultural based. From this, a random sampling of rural-based farmers, civil servant, students and artisans were selected. In all a total of one hundred and sixty-five respondents were selected for the study.

Data were collected with the aid of a questionnaire and information collected include, socio-economic characteristics, the level of awareness of the benefits of the traditional drinks under study, frequency of consuming and reasons for non-consumption of the drinks. Secondary data were also sourced from published journals, articles and from the internet.

Analytical Technique.

This study uses the Binary logistic regression to identify the factors that affect the probability for a respondent consuming any or all of kunun-zaki, pito, soborodo, ogi, and nunu drinks.

The consumption of selected traditionally-processed non-alcoholic drink is measured in this study using a dichotomous (binary) choice variable of "Yes" or "No" type indicating if the respondent has ever consumed any of the drinks or otherwise. In this case, a BLR can be used to examine the impacts of a set of independent variables (X_1, X_2, …, X_n) on the logistic function of the probability (P) for Y=1 (*i.e.*, P is the probability for Y=1). Estimation results of a logistic model can be used to identify factors that significantly contribute to the probability for Y=1 and examine the marginal impact of each significant independent variable on the odds ratio for Y=1. Following Zhang, et al., (2001),

the probability, *p*, that a respondent has ever consumed any or all of the selected drink is given by:

$$P = \frac{e^{x'\beta}}{1 + e^{x'\beta}} \quad 1$$

Central to the use of logistic regression is the Logit transformation of p given by Y

$$Y=\ln(p/1-p) \quad 2$$

$$Y= \alpha \sum_{1}^{n} \beta i Xi + e \quad 3$$

With Y being the latent variable representing 1 if the respondent has ever consumed the drink and 0 otherwise and x being the variables of interest that could influence the consumption. A review of literature suggests knowledge of the nutritional value of drink, taste, texture, appearance, health safety concerns, as the variables of interest that could influence food choice (Hackett, Kirby and Howie, 1997; Noble *et al.*, 2000; Olumakaiye and Ajayi, 2007). This study included availability, price, health concerns, age, education, gender as additional variables. The empirical explicit functional form estimated to assess the determinants of traditionally- processed drinks by a respondent is given by:

Yi = f age, price, livelihood activity, education, gender, knowledge of nutritional value of drink, taste, texture, appearance, health safety concerns, availability, + e)

Where Y_{ith} is the latent variable for the *ith* respondent denoted as 1 if the respondent has ever drunk the food drink before and 0 otherwise

RESULTS AND DISCUSSION

Respondents' socio-economic characteristic

The distribution of the respondents according to their educational status, livelihood activities and gender is presented in Table 1.

The socio-economic characteristics of the sample as summarized in Table 1showed that the socio-economic characteristics of the respondents are relatively representative of our sampled respondents. However, students have a higher representative percentage (34.6%), closely followed by public servants and artisans (27.7 %). This distribution has significance for market survey analysis. This is because; it enables prospective agri-business who wants to venture into food drink beverage category identifying the prospective and target consumers of such commodity. The percentage of male (55%) is a bit higher than the females (44%) and over 70% of the respondents have attained the secondary school educational attainment.

Table 1: Socio-Economic Characteristic of Respondents

Variables	Frequency	Percentage
EDUCATIONAL STATUS		
No formal education	11	6.7
Quranic Education	7	4.2
Adult Education	4	2.4
Primary Education	17	10.3
Secondary Education	41	24.8
Tertiary Education	85	51.5
Total	165	100
LIVELIHOOD ACTIVITIES		
Agriculture	15	9.1
Public servant	46	27.9
Artisan	46	27.9
Student	58	35.1
Total	165	100
GENDER		
Male	91	55.2
female	74	44.8
Total	165	100.0

Source: field survey

Consumers' Awareness of Traditional Food Drinks' Nutritional Benefits

As revealed in Table 2, Seventy five percent of respondents are aware of the nutritional benefits.

Table 2: Distribution of Awareness of benefits and types of traditionally-processed food drinks consumed by Respondents

Variables	**Frequency**	**Percentage**
Awareness of Nutritional benefit		
Aware	125	75
Not aware	40	24.2
Total	165	100
Distribution pattern of types of food drinks drunk		
Kunu	139	84.2
Ogi (pap)	149	90
Zobo	127	77
Fura-de-nunu	103	62
Pito	85	51.5
Frequency of food drink		
Daily	36	22.6
2-3 times in a week	60	37.7
Once in a week	28	17.6
Once in a month	35	22

Source: field survey, 2012

Awareness that consumers perceived includes energizing benefits, medicinal and laxative and calming benefits. The knowledge of the level of awareness is crucial for adoption process. Theoretically, Adoption is a mental process through which an individual passes from hearing to its adoption that follows awareness, interest, evaluation, trial, and adoption stages (Rogers, 1962). A high awareness benefits level about a commodity would invariably stimulate interest about the commodity, evaluation and use, trial and its eventual adoption. Given the relatively high awareness level of these food drinks category, it shows that investing the food drink would stimulate demand from consumers.

Furthermore, the Table reveals that the most frequently drunk was ogi made from corn (90%) and drunk in the form of form of pap and kunu drink made from guinea corn (84%). These were followed by zobo made from the Roselle calyx (77%), fura-de-nunu and pito (62%) made from maize and sorghum (Table 2).

Similarly, frequency of drinks consumed was highest at 2-3 times in a week with 37 % of the respondents consuming this food drinks category at this rate. Other frequency rates were daily by 22.6 %, once in a week by 17.6% and once in a month by 22% of the respondents. This indicates the acceptance level and relative absence of discrimination against these food drinks types by majority of the respondents sampled.

Result of the Binary Regression Analysis

The result of the Binary logistic regression for the determinant of consuming any or all of the traditional food drinks under study.

Table 3. Predictor variables

Predictor variables	**Coefficient**	**Standard error**	**Z value**	**P-value**
Constant	2.177847	1.247546	1.75	0.08*
Gender	.0408204	.3713784	0.11	0.912
Availability	1.083201	.6126005	1.77	0.077*
Price of the product	.15473	.4335684	0.36	0.721
Taste the product	.3947904	.4224815	0.93	0.350
Awareness of Nutritional benefits	.5780197	.4159614	1.39	0.165
Concern relating to hygienic Safety	-1.8012566	.4490061	-1.78	0.074*
Log likelihood=- 92.95				
Pseudo R^2=0.38				

Source: field survey, 2011

Legend: Single astericks (*) denotes significance of p value at 10%

As revealed in the Table 3, Pseudo R^2 of 0.38 indicated a relatively low relationship between prediction and grouping and this is an indication of non inclusion of predictor variables that could influence the decision to consume any

or all of the traditional drinks under study in the study area. However, empirical result for the BLR presented in Table 3 showed that of the entire predictor variables included in the model, the availability of the drink and the health safety concerns expressed by the consumer with respect to the drinks were the only significant variables that explained the probability of respondents' consumption of the selected food drinks at 10% probability level. Specifically, the study indicated that the probability of consuming any or all of the traditional food drinks under study by a respondent is increased by one unit if the availability of any or all of the drinks is increased by 1.08 units. Equally, the likelihood of consumption of any or all of the drinks is also increased by one unit with the assurance of safety of the drinks by 1.8 units. Contrary to previous studies that established taste preference as the main influence of food selection among the adolescents (Alderman, *et al.*, 1997; Drewnowski, *et al.*, and 1997; Abdallah, *et al.*, 1998), this study indicated that the decision to consume any or all of the traditional food beverage were more likely to be influenced by availability and safety concerns with respect to the validation that the products were produced under hygienic condition. If availability and safety assurance are such determinants to the willingness to consume this important food beverage category, it therefore follows that marketing agencies should endeavour to take advantage of the market potentials in the mass production by making the drinks available and in forms that would assure consumers of the safety issues that might be a blockade to demand.

The result indicated that availability is a major determinant that could stimulate frequency of consumption. Therefore prospective agri-business enterprise who wished to venture into the business of packaging traditional non-alcoholic beverage drink must ensure that drinks are available within the reach of interested consumers.

CONCLUSIONS

This study examined the level of awareness of the benefits and the determinants of consumption of traditionally fermented food drink beverage in Kwara State Nigeria. With a dataset of 160 surveyed respondents, the BLR model was used to identify the determinants of consumption of these category food drink group. The descriptive statistics was used to examined the level of awareness of nutritional benefits inherent in consumption. The results indicate a moderately high level of consumption of this food category by the respondents. Specifically of the options presented, the most frequently drunk was ogi made from corn (90%) and drunk in the form of form of pap and kunu drink made from guinea corn (84%). These were followed by zobo made from the Roselle calyx (77%), fura-de-nunu and pito (62%) made from maize and sorghum. Similarly, frequency of drinks consumption was highest at 2-3 times in a week with 37 % of the respondents consuming this food drinks category at this rate. These indicate that acceptance level and relative absence of discrimination against these food drinks types by majority of the respondents sampled. Equally, consumption was

influenced by availability of the products and the assurance of safety associated with the methods of processing.

Empirical results therefore suggest a high level of awareness among respondents as regards the nutritional benefits and consumption of this category of food drink and probability of consumption is further enhanced by availability and safety assurance of the product by regulatory bodies.

Based on these findings and in line with the focus on agricultural transformation agenda this study recommends that further research should be done on a cost effective way of improving on the hygienic acceptability of the drinks. Furthermore, food regulatory bodies should sensitize the food processing outfits on the requirements for standardization of their products. Marketing research should take cognizance of consumers' want and formulate appropriate marketing strategies would make the drinks more available to the general public as well as to be able to withstand the competition of non-indigenous beverage drinks imported into the country.

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ANALIZA DETERMINANTI KONZUMACIJE FERMENTISANIH TRADICIONALNIH PIĆA U DRŽAVI KVARA, NIGERIJA

SAŽETAK

Uzimajući u obzir vitalni doprinos tehnika tradicionalne prerade hrane na ruralni razvoj i održivi nacionalni razvoj, ovaj rad vrši istraživanja o svijesti potrošača o koristima, konzumiranju i determinati konzumacije kunun-zaki, pito, soborodo, ogi, i nunu, koji su primjeri fermentisanih tradicionalnih prehrambenih pića u državi Kvara, Nigerija. U svrhu istraživanja je u posmatranom području slučajno odabrano 165 ispitanika iz različitih socio-ekonomskih slojeva farmera, studenata i službenika. Za analizu podataka se koristila deskriptivna statistika i model Binarne logistike (BLR). Nalazi su pokazali da je svijest o nutritivnim benefitima pića relativno visoka (75%), te učestalost konzumacije 2-3 puta sedmično (60%). Ovo ukazuje na povoljnu poziciju pića, što bi moglo dovesti do moguće potražnje ove kategorije prehrambenih pića. Slično tome, na vjerovatnoću konzumacije je uticala raspoloživost pića ($p=0.1$) i potvrda bezbjednosti vezano za preradu ovakve kategorije pića ($p=0.1$). Na osnovu ovakvih nalaza, istraživanje preporučuje da se pitanja vezano za potvrdu bezbjednosti načina prerade prehrambenih pića rješavaju od strane nadležne prehrambene regulatorne agencije, te da marketinški agenti formulišu odgovarajuće strategije koje bi poboljšale raspoloživost i prihvatljivost pića od strane potrošača.

Ključne riječi: tradicionalna prehrambena pića, prihavtljivost od strane potrošača, marketing.