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Baker's Willingness to Utilize High Quality Cassava Flour (Hqcf) for Bread Production: Experience From Ogun State, Nigeria

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Abstract

One of the major reasons for introducing High Quality Cassava Flour (HQCF) inclusion in bread is to reduce its cost of production. The study thus evaluated baker's willingness to utilize HQCF for bread production in Ogun State. A multi-stage sampling technique was used to elicit information from 187 selected bakers. Results showed that 79.6% of the bakers were male, with a mean age of 39.5 years. The average year of bakery establishment was 10.7 years, with an average bread production period of 5 days per week, mean bread production of 361.0 loaves. Majority, 96.1% of the bakers were willing to utilize HQCF in bread production. In addition, 79.0% of the bakers would accept HQCF if it is readily available and 72.6% were willing to utilize readily mixed HQCF with wheat flour. Pearson Product Moment Correlation revealed a significant relationships ($p<0.05$) between willingness to utilize and quantity of bread loaves produced per day ($r = 0.280$); year of bakery establishment ($r = 0.253$); awareness of cassava inclusion policy ($r = -0.273$); awareness of potential value of HQCF inclusion in bread production ($r = -0.340$) and the bakers' willingness to utilize HQCF. The study concluded that bakers were willing to utilize HQCF for bread production in the study area.

Keywords: *HQCF, willingness to utilize, Ogun State.*

Introduction

Cassava-based products, particularly *gari, lafun, fufu, tapioca* or starch, constitute the major staple food `in Nigeria. This cannot be unconnected with the fact that cassava constitutes the dominant crop production, particularly in the southern part of the country. According to Ndubueze-Ogaraku and Edema (2015), Nigeria is the largest producer of cassava in the world producing about 45.72 million tonnes of cassava tubers from 3.81 million hectare of farmland in 2006. Alongside cassava-based food consumption is increased consumption of bread by all classes of Nigerian households. While cassava is locally cultivated and processed for production of cassava-based food, bread production on the other hand depends on wheat, which is largely imported from foreign countries. According to Australian Export Grains Innovation Centre,

AEGIC,(2015), Nigeria is the major importer of wheat, importing over 90% of her wheat from the USA for the production of bread and other confectioneries, while the production of cassava-based products are dependent on cassava produce in Nigeria.

According to Elemo (2012), Nigeria spent about ₦1.087 trillion on wheat importation between 1999 and 2010; and in 2010 alone, the country imported 3, 971,861 tonnes of wheat at the rate of $1.04 billion. This is a huge cost to the nation and as well a means of draining the foreign reserves. With development of value-addition to cassava for production of High Quality Cassava Flour (HQCF), Nigerian Government began to look inward for exploitation of its large volume of cassava production for production of HQCF. In the light of this was the enactment of HQCF inclusion policy by the Federal Government of Nigeria to reduce the amount spent on wheat importation. Implementation of the inclusion policy began with the regime of President Olusegun Obasanjo in 2002 with 10% HQCF inclusion policy in bread production 5% inclusion by the late President Musa Yar`Adua (2007 – 2010). With President Jonathan administration is implementation of 40% HQCF inclusion in bread production (Ohimain, 2014). This inclusion policy is aimed at reducing expenditure of national reserves on wheat importation. According to Elemo (2013), HQCF inclusion in bread production in Nigeria has the potentials of saving the country between ₦31.75 and ₦254.0 billion on inclusion of between 5 and 40% of HQCF in bread production.

In an attempt to comply with Federal Government mandate on cassava inclusion policy, adding value to bakery products and maximise profit, industrial bakers in Nigeria namely Food Concepts Butterfield, and Leventis-Value bread, had begun inclusion of HQCF in bread production. There is however the need for the small scale bread bakers to equally embrace HQCF inclusion in bread production in the country. In order for this aim to be achieved, concerted efforts had been made by the Federal Government and research institutes to create awareness of HQCF inclusion in bread production through media such as electronic broadcast, print, seminar and workshop. The success of HQCF inclusion in bread production not only depends on the bakers' awareness of HQCF inclusion in bread production, but also on the availability, affordability and quality of the flour (HQCF) to the bakers.

Objectives of the Study

The general objective of the study is to examine baker's willingness to Utilize High Quality Cassava Flour (HQCF) for bread production. The specific objectives of the study were to:

1. Ascertain baker's personal characteristics in the study area
2. Ascertain baker's production characteristics in the study area
3. Determine baker's mode of awareness of cassava based bread /HQCF
4. Determine baker's awareness of cassava inclusion
5. Determine baker's awareness of the proportion of HQCF inclusion
6. Determine baker's awareness of the proportion of HQCF inclusion
7. Determine baker's awareness of the Potential Value of HQCF
8. Determine bakers' willingness to utilize HQCF in bread production

Hypotheses of the Study

The study also tested two null hypotheses:

Ho_1: There is no significant association between the baker's production capacity and willingness to utilize HQCF for baking.

Ho_2: There is no significant relationship between bakers' awareness of HQCF inclusion policy/potential value and their willingness to use HQCF for bread production.

Methodology

Out of the five (5) branches of registered bakers in Ogun state namely; Abeokuta, Ijebu, Ilaro, Ado-Odo/Sango and Ifo

branches as grouped by Ogun State Master Bakers Association, three (3) branches namely, Abeokuta, Ado–odo/Sango and Ifo branches were purposively selected due to large market for bread in the zones. A total population of 187 bakers (50%) were randomly selected across the zones, 62 bakers from Abeokuta, 82 bakers from Ado-Odo/Sango while 43 bakers were selected from Ifo respectively. The dependent variable was baker's willingness to utilize HQCF and it was measured at a dichotomous level of utilized (1) not utilized (0). Data collected were analysed and subjected to both inferential and descriptive statistical analysis using statistical Package for Social Sciences **(SPSS)** version 15.0**.** Descriptive statistics such as mean, percentage, standard deviation and frequency distribution were used for data measurement while Inferential statistical tool as such as Pearson Moment Correlation (PPMC), was used for hypothesis testing at, 0.01 and 0.05level of significance.

Results and Discussion

Description of personal data of the bakers

Table 1 reveals that 33.1 percent of the bakers were within the age range of 41 – 50 years, 79.6 percent were male, 89.1 percent of the respondents were married. 10.8 percent were single. 37.6 percent of the bakers had secondary school education; reveals that 62.4 percent of the bakers were Christian while Muslim were 37.6 percent of the bakers. Less than half 37.6% of the bakers had secondary school education. The mean Household size of the respondents was found to be 5 persons. This shows that majority of the bakers were mostly male and in their active productive age with it one form of education which could help the bakers in managerial ability of the baking business. The mean income of bakers per week was ₦21,769. 58 percent of the bakers earned below ₦20,000 per week from bread production.

Table 1: Personal data of bakers

Variables	Frequency	Percentage	Mean/Mode
Age (years)			
Less than 30	40	25.5	40 years
31-40	39	24.8	
41-50	46	29.3	
51-60	26	16.6	
Above 61	6	3.8	
Sex			
Female	32	20.4	Male
Male	125	79.6	
Marital status			
Single	17	10.8	Married
Married	140	89.1	
Educational Status			
No formal education	19	12.1	Secondary Education
Primary education	51	32.5	
Secondary education	59	37.6	
Tertiary education	28	17.8	
Religion			
Christianity	98	62.4	Christianity
Islam	59	37.6	
Household size			
Less than 3	75	47.8	5 persons
4 – 7persons	64	40.8	
8persons and above	18	11.5	
Income Per week			
Less than 20000	91	58.0	#21,769.06
21,000 to 40,000	22	14.0	
41,000 to 60,000	22	14.0	
Greater than 61,000	22	14.0	

Source: Field survey data, 2014

Production capacity of the bakers

Findings 2 show that 39.4 percent of the bakers established their bakery between the year 2009 and 2014. Although the result, shows that about one third of the bakers were reluctantly new in the business, most of them were experienced bakers and as such were in position to provide information on bread baking issue. 43.3 percent of the bakers baked bread for about 3 to 5 days in a week. Findings reveals that 90.4 percent of the bakers used 1-3 bags of flour per production and 1.9 percent used 2 bags of flour with the mean of 2 bags of flour for bread production and 56.1 percent of the bakers produced 200 loaves of bread. it implies that most of the bakers in the bakery industries were small scale producers and the number of bags of flour is a determining factor for the loaves of bread produced.

Table 2: Production Capacity of the Bakers

Variables	Frequency	Percentage	Mean/Mode
Years of Bakery establishment			
Before 1995	8	4.90	2009-2014
1996-2001	40	25.6	
2002-2008	47	30.0	
2009-2014	62	39.4	
Days of bread production/Week			
Less than 2days	42	26.7	4days
3-5days	68	43.4	
6days and above	47	30.0	
Bags of flour used per production			
Less than 3bags	142	90.4	2bags
4-6bags	12	7.6	
7bags and above	3	1.9	
Loaves of bread per production			
Less than 200 Loaves	88	56.1	350 loaves
201-400 Loaves	35	22.3	
401-600 Loaves	17	10.8	
601-80l Loaves	4	2.5	
801-1000 Loaves	6	3.8	
Above 1000 Loaves	7	4.5	
Types of flour used			
Mainly whole wheat	19	12.1	Mainly wheat flour
Mainly wheat flour	92	58.6	
Mainly cassava flour	5	3.2	
Mixture of cassava flour and wheat flour	41	26.1	
Years of experience in bread production			
Less than 10	99	63.1	11 years
11-20	43	27.4	
21-30	13	8.3	
31 and above	2	1.3	

Source: Field survey data, 2014

Baker's mode of awareness of cassava based bread /HQCF

In Table 3 Majority (94.9%) of the bakers heard about cassava bread and HQCF, 80.2 percent of the bakers claimed to have seen where cassava bread is produced, 75.2 percent of bakers had eaten cassava bread before, 63 percent were aware that large scale master bakers UTC, uses cassava flour in bread production, 63.6 percent of the baker were aware of the need additional improver during HQCF inclusion in bread baking. This observation implies that the bakers became aware of the existence of cassava – based bread in different dimension. In view of this it suggests that cassava based – bread is well known among the surveyed bakers.

Table 3: Baker's mode of awareness of cassava- based bread /HQCF

Variables	Frequency	*Percentage
Heard of cassava-based bread	149	94.9
Sighting of cassava-based bread	126	80.2
Tasted /consumption of cassava -based bread	118	75.2
Awareness of HQCF usage by Food industry	99	63
Bread improver for HQCF inclusion	100	63.6

Source: Field survey data, 2014
*Multiple responses

Awareness of cassava inclusion policy

Table 4 shows bakers' awareness of cassava inclusion policy as mandated by the Nigeria Government. Majority (70.7%) were aware that Federal government initiated the use of cassava flour in bread baking and 60.5% revealed there is a law guiding the use of HQCF. However, 57.9% of the bakers were not aware of the Federal Government promises of 12% tax reduction on the use of HQCF, 65% bakers were aware of the free-starter pack of HQCF. Also, 71.4% of the bakers were aware that Government established cassava bread development fund to support bakers and 71.4% were aware of cassava based – bread training put in place by the Federal Government of Nigeria for bakers and flour mills on HQCF inclusion. The findings shows from the table that majority of the bakers were aware of High Quality Cassava Flour and inclusion policy introduced by the Federal Government of Nigeria in 2012.

Table 4: Bakers' awareness of cassava inclusion policy as mandated by the Nigeria Government

Items	Frequency	Percentage
Mandate on partial substitution of wheat flour with HQCF	97*	61.8
Federal government initiated the use of HQCF	111	70.7
Law guiding and backing the use of HQCF in bread making	95	60.5
Promise of 12% reduction in corporate tax for 40% use of HQCF	66	42.0
Provision of free-starter packs of composite flour and bread improver	102	65.0
Provision of cassava bread development support fund for bakers/flour mills	112	71.4
Production training on HQCF inclusion to bakers	112	71.4

Source: Field survey data, 2014
*Multiple responses

Awareness of the proportion of HQCF inclusion

Result in table 5 shows that more than half (55.4%) of the bakers were aware of the 10% cassava inclusion and 33.8% of them were aware of 5% HQCF inclusion. This is in consonance with the research conducted by the Federal Institutes for Industrial Research Oshodi (2006) which revealed that10% -15% HQCF inclusions is acceptable in bread production also the advertisement of golden penny and honey well flour mills affirm 10% HQCF inclusion in their flour production. In the Table 6, only 1.9% of the bakers show they were aware of the 40% inclusion policy as President Goodluck Jonathan administration proposed. This implies the information about 40% HQCF inclusion in bread production was not well disseminated among them.

Table 5: Percentage of HQCF Inclusion

Variable	Frequency	Percentage
5%	53	33.8
5%	53	33.8
10	87	55.4
20	7	4.5
30	7	4.5
40	3	1.9

Source: Field survey data, 2014

Baker's Awareness of the Potential Value of HQCF

Table 6 indicates that 64.3% of the bakers were aware the HQCF substitution in wheat flour use for bread production. This result implies that the rate of bakers' awareness on the innovation of HQCF substitution is high. Also, 63% of the bakers were not aware HQCF could reduce cost of bread production, Majority (59.2%) of the bakers were not aware that HQCF inclusion can reduce the country's expenses on wheat importation and more than half (65.6%) of the bakers were not aware that when HQCF is utilize in bakery in substitute of wheat flour it can reduce the price of wheat in the international market. This implies that the relative advantage of HQCF inclusion in cassava based – bread production in terms of profit maximization which was the major target and potential the Federal Government of Nigeria want to achieve from HQCF inclusion was not disseminated to the bakers.

Majority (70.1%) of the bakers in the study area were not aware baking cassava based- bread takes same procedure as baking bread with wheat flour only. This implies that bakers were not aware inclusion of HQCF is compatible with wheat flour and its inclusion in bread production does not alter any change to the production system in terms of equipment use, ingredient, time of production and taste. Also 59.2% of the bakers were aware HQCF does not have any detrimental effect on bread production and man's health. This is in support of Ignatius Onimawo research work published in manufacturing today Nigeria newspaper (2013) on cassava and diabetes, the result revealed that the inclusion of cassava flour in bread production might not pose a threat to blood glucose response of individual's consumers. The prevalent rate of diabetes in the country has been on increase because of mode of lifestyle and dietary habits, the condition had not been linked with cassava consumption. Also, in support of this Christian, (2012) stated NAFDAC's recommendation on cassava bread stating cassava bread is wholesome to eat without any health hazard.

Table 6: Awareness of the potential value of HQCF

Items	Not at all	Not really	Certainly	Mean	S.D
HQCF substitute for wheat flour	*14(8.9)	42(26.8)	101(64.3)	1.48	0.667
HQCF reduces cost of production	99(63.0)	41(26.1)	17(10.8)	1.52	0.698
Baking with cassava flour takes same procedure as use with wheat flour	110(70.1)	26(16.6)	21(13.4)	1.47	0.738
HQCF require no additional equipment in bread baking	108(68.8)	36(22.9)	13(8.3)	1.42	0.651
High utilization of HQCF can reduce the price of wheat flour	103(65.6)	39(24.8)	15(9.6)	1.48	0.678
Bread from cassava flour is the same as bread from wheat flour	94(59.8)	31(19.7)	32(20.4)	1.64	0.817
HQCF inclusion has detrimental effect on bread production and man's health	93(59.2)	35(22.3)	29(18.5)	1.64	1.38
HQCF would reduce the country's expenses on wheat importation	112(71.3)	35(22.3)	10(6.4)	0.796	0.612

Source: Field survey data, 2014, *Multiple responses

Bakers' willingness to utilize HQCF in bread production

Table 8 shows the categorization of bakers' willingness to utilize HQCF in bread production. The categorization of bakers' willingness to utilize HQCF ranged from 12-36, bakers' willingness was categorized into three categories thus; 12-19 (not willing to utilize), 20-27 (less willing to utilize) and 28-36(willing to utilize).

Majority (96.1%) of the bakers were shows their willingness to adopt/utilize HQCF in their bread production while only few bakers with 3.8% showing they are less willing to adopt the use of HQCF in their bread production. It shows that majority of the baker that are willing to utilize HQCF in their bread production can be categorized as the early adopter according to Rogers (2003) categorization of innovation adopters. The relative advantage of HQCF to wheat flour such as cheaper price of HQCF, economic value that is the increase in the profit of bakers when they include HQCF in cassava based-bread production ; the simplicity of mixing HQCF and wheat flour to form a dough in bread production. Also, the marketability and acceptability of cassava based - bread by the consumers encourage bakers willingness to utilize HQCF in their bread production. Another factor that could motivate baker's willingness to utilize HQCF is the readiness of flour mill to produce already mixed HQCF with wheat.

Table 7: Bakers' willingness to utilize HQCF in bread production in range

Variable	Categorization	Frequency	Percentage
Less willing to adopt HQCF	20 – 27	6	3.8
Willingness to adopt HQCF	28 – 36	151	96.1

Source: Field survey data, 2014

Hypotheses Testing

Bakers' production capacity and their willingness to utilize HQCF in bread production

Table 8 reveals that there was significant relationship between the quantity of loaves of bread produce per production (r=0.280, P=0.002); and bags of flour used per production (r=0.253, p=0.003) and the bakers willingness to utilize HQCF all at P< 0.05 level. This implies that willingness of the bakers to utilize HQCF is largely influenced by their experiences on quantity of bread produced per production cycle and the quantity of bags of flour used for production. However there is no significant relationship between income(r=0.119, P=0.184), days of production (r=0.192, P=0.017), year of bakery establishment (r= 0.142, P=0.086) and bakers willingness to utilize HQCF. This implies that irrespective of the income bakers generate from bread baking it does not influence their willingness to utilize HQCF in bread production, the number of day's bread is produced in a week and the year of bakery establishment is not a criterion for bakers' willingness to utilize HQCF in bread production.

Table 8: Pearson Correlation Analysis between the bakers' production capacity and their willingness to utilize HQCF

Variable	r	p-value	Decision
Income	0.119	0.184	NS
Days of production	0.192*	0.017	NS
Year of bakery establishment	0.142	0.086	NS
Loaves of bread produced/Production	0.280**	0.002	S
Bags of flour used per production	0.253**	0.003	S

Source: Field survey data, 2014

** Correlation is significant at 0.05 levels

* Correlation is significant at 0.01 levels

Bakers' awareness of HQCF inclusion policy/potential value and willingness to use HQCF

The Pearson Product Moment Correlation (PPMC) analysis shows in Table 9 also showed that there is significant relationship existing between bakers' awareness of cassava bread produced from HQCF (r= - 0.273,P< 0.020), awareness on potential value of HQCF(r= -0.340, P< 0.001) and willingness to utilize HQCF in bread baking. The result shows a negative sign which indicate although bakers were aware but there is inverse relationship between their awareness and their willingness to utilize The rate of awareness does not influence baker's willingness to utilize HQCF in their bread production, It thus explain if bakers were well informed and sensitized on the awareness of cassava based - bread also with the opportunity to see, taste and have access to participate in the training organized by the Federal Government of Nigeria on HQCF in cassava based – bread production. The more bakers are aware of HQCF in cassava bread the

more they are willing to adopt. The aspect of HQCF potential value was not hidden from bakers, HQCF benefit in terms of the added benefit and quality HQCF possessed.

Table 9 result shows there was no significant relationship between awareness of cassava inclusion policy (r= -0.134, P< 0.223) and willingness of bakers to utilize HQCF in bread production. This implies that the enforcement of law and policy on cassava inclusion in cassava based – bread production does not influence baker's willingness to utilize HQCF in bread production. This may tend to be affected by the policy inconsistency in Nigeria, that might make bakers to believe that the inclusion policy is just a Federal Government threat and it may not last or be passed into law by the house of assembly as done to other policies on food and Agriculture in general.

Table 9: Test of correlation between awareness and willingness to utilise HQCF

Variable	r	p-value	Decision
Bakers awareness	-0.273*	0.020	S
Potential of HQCF awareness	-0.340**	0.001	S
Cassava inclusion policy awareness	-0.134	0.223	NS

Source: Field survey data, 2014
** Correlation is significant at 0.05 levels
* Correlation is significant at 0.01 levels

Conclusion and Recommedation

This study revealed that bakers in Ogun State were aware of High Quality Cassava Flour and the potential value in High Quality Cassava Flour used in cassava based-bread production. In accordance with the results of the research study, most of the bakers were in their mid-age of 40 years with average 10 years of bread baking experience. The level of awareness on HQCF and cassava-based bread among bakers was high. Bakers are aware of HQCF as substitute for wheat flour and bakers are willing to include 10 percent of HQCF in wheat bread use in production of cassava based – bread production. Result showing the categorization of baker's willingness to utilize HQCF in bread production revealed that majority of the bakers (96.1%) with only 3.8% not willing to utilize the High Quality Cassava Flour.

Based on the findings of this study, the following recommendations are given: Public (consumers) should be sensitized to purchase and eat cassava based-bread, Production of the HQCF should be monitored so as to ensure production of quality HQCF based –flour, Flour mills that are not into production of HQCF based-Flour (composite Flour) should be encouraged produce, since the baker's shows willingness to buy and HQCF-based bread, Training on how to use HQCF in bread production should be carried out in each branches and zone with every members present and with each member given a sample to test in their various bakery, Federal Government should pass into law and enforce the mandatory inclusion of HQCF in flour production and bread baking, Incentives like free-starter packs of composite flour should be given to bakers, reduction in corporate tax and fund to support large scale bakery.

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