Willingness to Use Composite Flour that Contains High Quality Cassava Flour (HQCF) among Bread and other Confectioneries Producers in Oyo State, Nigeria

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Grace Adebukanla Shittu[1]
Fatai Abiola Sowunmi[2]

[1,2]*Department of Agricultural Economics, University of Ibadan, Ibadan, Nigeria.*
[1]*Email: shittubukky@gmail.com Tel: 2347055318189*
[2]*Email: fasowunmi@live.co.uk Tel: 2348033105296*

(*Corresponding Author*)

ABSTRACT

The study examined the willingness to use composite flour that contains high quality cassava flour (HQCF) among bread and other confectioneries producers in Oyo state, Nigeria. Two-stage sampling method was used to selected 255 respondents using structured questionnaire. The study revealed that 42.0% of the bread producers and 14.0% of the other confectioneries producers were willing to use HQCF. The composite flour policy had positive effect on wheat importation ($p<0.01$). There was significant difference in the cost incurred on composite flour and whole wheat flour per production for bread ($p<0.05$) and other confectioneries ($p<0.01$) producers. Bread producers and other confectioneries producers used composite flour that contained averages of 73.8kg and 1.4kg of HQCF per production. The average costs of the HQCF were ₦20,674.4 and ₦403.2 for bread and other confectioneries per production respectively. Access to HQCF, Sales revenue per production were factors that influenced the willingness to use composite flour that contains HQCF by bread producers while age of respondent, participation in training on the use of HQCF and experience in baking were factors that influenced willingness to use composite flour that contains HQCF by the other confectioneries producers. Enforcement of the policy on the flour millers to produce composite flour that contains HQCF by government coupled with enlightenment and intensive training on the use of composite flour would help raise the willingness to use composite flours containing HQCF among bread and other confectioneries producers.

Keywords: *Importation substitution, Composite flour, HQCF, Willingness to use, Bread, Confectioneries, Preference, Policy.*
JEL Classification: *C12, C34, D12, D24, D51, Q18.*
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Highlights of this paper

- The study focused on the willingness to use composite flour containing HQCF by bread and other confectioneries producers in Oyo state.
- This is an effort to research into the possibility of reducing the importation of wheat in Nigeria while making use of cassava that the country has comparative advantage in the production, and also encouraging value addition to Agriculture produce in Nigeria.

1. INTRODUCTION

Nigeria is faced with challenging economic environment, for example, in the second quarter of 2016, the nation's gross domestic product (GDP) declined by -2.06% (year-on-year) in real terms. This was lower by 1.70% points from the growth rate of -0.36% recorded in the preceding quarter, and also lower by 4.41% points from the growth rate of 2.35% recorded in the corresponding quarter of 2015 [1]. The country grapples with the slowdown in the economy, weakening local currency, spiraling inflation, and hike in food prices amidst low global oil prices (with prices of oil collapsing from USD 112 per barrel in 2014 to less than USD 50 per barrel by the time the recession began), yet the population is on the increase [1]. Agriculture being a major sector is not performing as expected in terms of food supply, contribution to GDP, job creation and foreign exchange generation. This is due to the neglect over years, shift in focus to crude oil (oil accounts for 95% of Nigerian export while agriculture contributes less than 5%) [2] poor mechanization, low public spending on agricultural research as a proportion of agricultural gross domestic product, mismanagement of resources, low public investment and inadequate value addition across the value chain (losing about $10billion worth of export in agriculture annually due to absence of value addition), among others [3].

The consequence of these problems include inability of most households to access food as a result of loss of job or irregular or part payment of monthly salary by both government and private employees, the country which once exported food now spends up US $22billion on food importation yearly to sustain itself. It was widely documented that the import bill for food in Nigeria is exceptionally high and is growing at an unsustainable rate of 11% per annum. For example, total wheat import was only 78,000 metric tonnes in 1960. This rose to 1,400,000 MT in 1980; 1,913,000 MT in 2000; 4,051,000 MT by 2010 and 4,400,000 MT in 2016 compared to the domestic production of 60,000 tonnes per annum [4]. Nigeria spent $882 million in 2015 and over $660 million on wheat import between January and September 2016 when valued at an average price of $200 and $150 per metric tonne respectively Okon [5]. Abubakar [6] revealed that Nigeria is the largest importer of US hard red and white wheat worth ₦635 billion annually. Presently, Nigeria stands as the thirteenth largest importer of wheat in the world. Although, bulk of the money spent on this importation was not generated from agriculture but from crude oil (75% of the consolidated budgetary revenue is from crude oil).

However, in order to reduce the huge amount of spent on wheat importation annually; government came up with a policy on composite flour that contains HQCF in 2005 aimed at addressing the amount spent on wheat importation, increase the profit margins of bread and other confectioneries producers and generate employment opportunities for Nigerians along the cassava value chain. The policy requires flour millers to include between 10-20% of cassava flour (High Quality Cassava Flour)1 in flour production. The proportion was initially at 10%, though Government had a 40% target inclusion by 2015. The bread producers who are the major consumers of wheat flour where mandated to use composite flour of 10% cassava and 90% wheat for bread production [7-10].

[1] High quality cassava flour (HQCF) is simply unfermented cassava flour. It can be used as partial replacement for many bakery and pasta products. High Quality Cassava Flour (HQCF) can be used as an alternative for starch and other imported materials such as wheat flour in a variety of industries in many countries in Africa (2016).

More importantly, Nigeria has comparative advantage in the production of cassava, which is produced in almost all the agro-ecological zones in the country [11]. Nigeria is the largest cassava producer in the world [12, 13]. Despite the introduction of the policy on the use and production of composite flour, importation of wheat has continued to increase yearly [14]. Several reasons have been adduced for the failure of this policy. These include policy inconsistency, legal and administrative challenges, feedstock challenges, technological challenges, pricing and logistical challenges. Elemo [13] listed some of the major challenges of the cassava bread to include pricing, technology, demand and supply and acceptability. Other challenges facing the acceptability of HQCF include the change in quality and taste of baked goods, increased costs associated with inclusion of enzymes in the bread making process to ensure consistent bread quality and limited availability of high quality cassava, lack of information about nutritional value, thermo- physical properties, mixing strength, fast fermentation and sensory attributes, among others [15]. Since importation of goods involves sellers and buyers, success of the use of composite flour in Nigeria will compel flour millers to redesign their production units while producers of wheat are expected to record drop in sales. Nwanekezi [16] identified possible sabotage from multinational flour milling companies through importation of low quality wheat for their mills since the percentage of non-wheat flour incorporated with wheat flour to form composite flour suitable for bread making depends on the quantity and quality of gluten protein.

Till to date, Nigeria still relies heavily on whole wheat flour for bread and other confectioneries production. The current economic reality is an indication that wheat importation is not sustainable fiscally, economically and politically. According to United States Department of Agriculture [17] and Pasqualone, et al. [4] there were drops in the importation of wheat in the immediate (2006, 2007 and 2008) years that the policy was put in place see Figure 1. The importation has since been rising steadily over the years with the exception of significant drops in years that coincided with the drop in Nigeria's revenue from crude oil as a result of reduced price of crude oil per barrel in the world market. The quantity of wheat imported in 2015 was 4.4million MT, this rose to 4.9million MT in 2016 and later dropped to 4.8million MT in 2018. It is estimated that successful replacement of 10% of wheat flour with cassava flour (HQCF), the government will save an estimated US$40 million per year, which, it says, will be injected into the Nigerian cassava industry. This will not only encourage cassava cultivation but also creates employment opportunities along the value chain. Apart from its local consumption, cassava has a wide range of industrial products, such as ethanol, glue, glucose syrup, industrial starch, and livestock feeds.

The role of bread and other confectioneries producers in the success of composite flour utilization cannot be overemphasized. The Nigerian bread segment, is estimated at N122.1 billion (US$621 million), representing 80% of the baked goods sector while biscuit segment, was estimated at N121 billion (US$617 million). Annual productions were estimated at 554,270 and 152,490 tonnes for bread and biscuit respectively [15]. Bread production in Nigeria, both artisanal and branded, is dominated by local players. This is because players service target markets within specific localities, driven by the mass market demand for freshly produced bread. Product differentiation is key in a highly competitive market through varieties: whole wheat marketed as a healthier alternative; cassava; whole meal; white bread; whole grain; etc.; or via packaging and branding, aimed at appealing to different target markets. The Nigerian bread and other baked goods segment are also highly fragmented. Seventy two percent (72%) of the market, as at 2015, was controlled by artisanal and other relatively small to medium regional players. In biscuit segment, five major players control almost 90% of the market share, with small players making up the balance [15, 18].

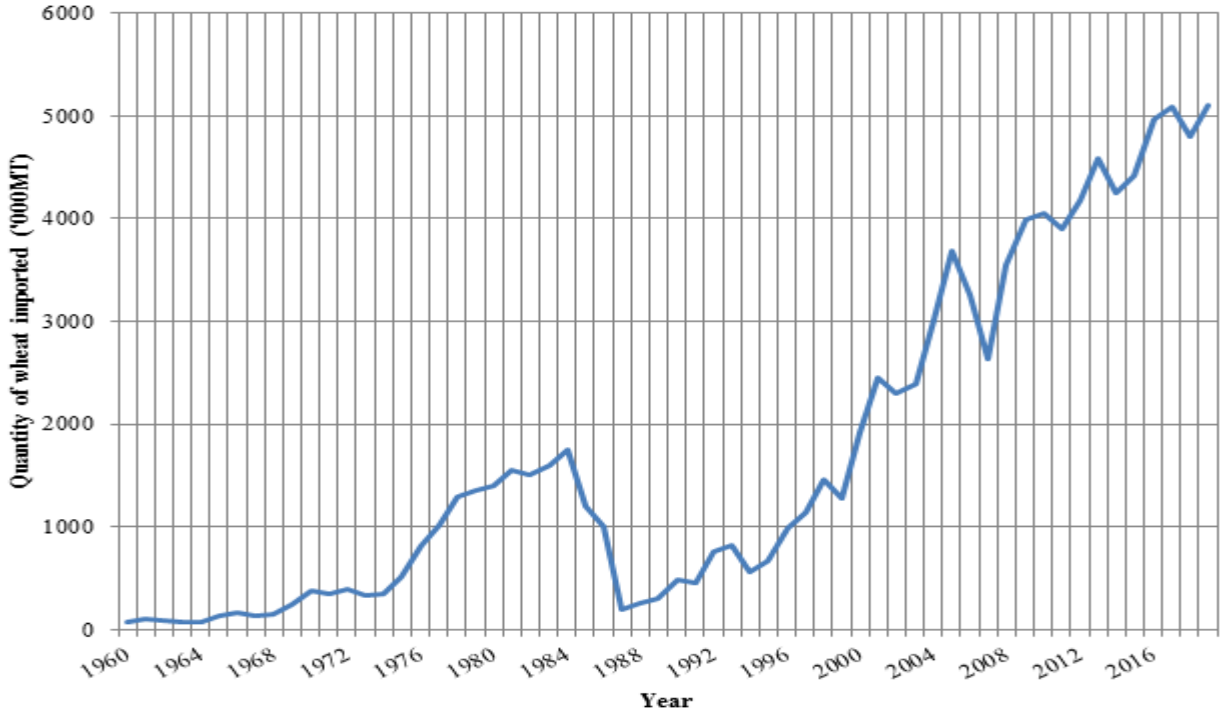

Figure-1. Quantity ('000MT) of wheat imported (1960 – 2018).
Source: United States Department of Agriculture [17].

Moreover, most studies on HQCF address its chemical composition, as well as comparing its final products with whole wheat [19-22]. Others worked on the willingness of consumers to pay for bread with HQCF Adepoju and O. [23] ; Ukaoha, et al. [24]; Oviahon, et al. [25] and Oni, et al. [26]. With the exception of few institutional and cooperate bakeries that display their use of composite flours on packages, the extent and the willingness to use composite flour that contains HQCF by the artisanal bakers who are in the majority have not been given adequate attention in studies [30-33]. The study is aimed at bridging this knowledge gap by examining the willingness of bread and other confectioneries producers to use composite flour that contains HQCF bearing in mind its ability to increase the profit margin of the users. To achieve the objective of the study, the following research questions were raised: What is the extent of bread and other confectioneries willingness to use composite flour containing HQCF in the study area? Was there significant variation in the average amount spent on composite flour and whole wheat flour by users in the study area? Is there significant variation in the quantities of wheat imported before and the introduction of policy on composite flour? What was the effect of composite flour policy on wheat importation? What are the factors influencing the willingness to use composite flour by bread and other confectioneries producers in the study area?

2. THEORETICAL FRAMEWORK AND LITERATURE REVIEW

There are two theories underlining this study. These include the theory of demand and theory of consumer preference. The concept of willingness to use emanates from the theory of demand which in economics, aims at describing the behaviour of consumers [27]. For this research, the demand of bread or other confectioneries producer is the number of kilograms of HQCF he/she purchased at various prices, which will take place if they are willing to use HQCF.

Consumer preferences are defined as the subjective (individual) tastes, as measured by utility of various bundles of goods. They permit the consumer to rank these bundles of goods according to the levels of utility they give the consumer. Preferences are independent of income and prices. This explains that, for a baker or confectioneries

producer to make decision on whether or not to use HQCF, he does not only consider how to maximize profit from that, but on how to attain the highest level of utility otherwise referred to as utility maximization [28]. Like all other producers of commodities, bakers or confectioneries producers have a level of utility they want to meet and therefore make choices based on their level of utility.

Various analytical tools had been used in studies of willingness to use, pay or adapt for a commodity/technology. These tools include contingency valuation [23, 29-31] logit regression model [23, 30, 32], tobit regression [31, 33] probit model [26, 29, 32, 34] double hudle model [47] and heckman model [35-37]. The choice of probit regression in this study is because it helps to overcome the problem of heteroskedasticity and prediction lying outside (0, 1) interval associated with other models.

2.1. Analytical Framework of Probit Model

The Probit model is associated with the cumulative normal probability function. It is use to obtain estimates of parameters and at the same time obtaining information about the underlining unmeasured scale index. The values of the independent variable X is transformed to a probability that ranges in value from 0 to 1. The model is used to overcome the problem of heteroskedasticity and prediction lying outside (0, 1) interval associated with other models [38].

Probit model is mathematically represented as seen in Equation 1:

$$\Phi(\beta X_i) = \int_{-\infty}^{\beta X_i} \frac{1}{\sqrt{2\pi}} \exp\left[\frac{-t^2}{2}\right] dt \qquad (1)$$

Where:

ϕ (βxi) is normally distributed and represents the probability that the ith individual will pay for a given product.

β is a vector of unknown coefficients; xi is a vector of characteristics of the ith individual; t is a random variable distributed as a standard normal deviate.

exp is the exponential function. The probability of paying is the area under the standard normal distribution curve lying between - ∞ and βxi. The larger the value of βxi, the more likely an individual is willing to pay for a new product.

3. METHODOLOGY

3.1. Description of the Study Area

The study area was Oyo State. Oyo state is located in the South-West geopolitical zone of Nigeria, Oyo State was one of the three States carved out of the former Western State of Nigeria in 1976. Oyo State consists of 33 local government areas. The 2006 population census figure indicated that, Ibadan constitute about 63.75 percent (3,565,108) of the state population of 5,591,589 people [39]. With many urban towns, Oyo State serves as the hub of commercial and administrative activities in Southwest. The large population in particular encourages high demand for various flour products ranging from bread to other confectionaries (meat pie, sausages, egg roll, doughnut, puff puff and chin chin among others). Hence, the location of many bread and other confectioneries producers in the State to cater for the demands of the numerous customers.

3.2. Sample Selection and Data Collection

Multi-stage two-stage sampling was used to select respondents in the study area. Four major towns within the state (well-known with high population of bread and other confectioneries producers and consumers as well as formidable association of bread bakers) were purposively selected. The selected areas were Ibadan, Oyo, Ogbomosho and Iseyin. Using the list obtain from the corresponding associations, eighty (80) bread bakers and ninety (90) other confectioneries producers were randomly selected from Ibadan (the was because Ibadan had the largest population of small scale bakeries), twenty (20) bread bakers and thirty (30) other confectioneries producers were randomly selected from each of the other three towns; thus giving 300 respondents in all. Data were collected using structured questionnaire. The choice of questionnaire is because it ensures uniformity of data from respondents. However, out of 300 questionnaires administered, 255 were good enough for analysis.

3.3. Data Collected and Utilized

The study utilized primary data and secondary data. Structured questionnaire was used to collect primary data on the socioeconomic characteristics of respondents (age, sex, marital status, household size, educational status, monthly income, and years of experience), type of confectioneries business, quantity of output per production, sales revenue per production, Awareness about composite flour that contains HQCF, source of information, access to composite flour, source of composite flour, access to training, utilization of composite flour, reasons for using or not using composite flour and the amount respondents were willing to pay for composite flour that contains HQCF among others. Secondary data were obtained from United States Department of Agriculture on the quantity o wheat imported ('000 MT) by Nigeria from 1960 -2018.

3.4. Data Analysis

To achieve the objective of the study, Data collected were analysed using descriptive statistics, difference of means, multiple regression and probit regression analyses. Multiple regression was used to determine the effect of time and composite flour policy on the quantity of wheat imported per annum. The model utilized is shown in Equation 2:

$$Y = \alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \upsilon_0 \qquad (2)$$

Where:

Y represents the quantity of wheat ('000 MT) imported per year.

X_1 represents the period (year).

X_2 represents the period before policy was put in place and period after policy was put in place (Before policy period = 0, During policy period = 1).

α_i represents the coefficients of the explanatory variables.

a'priori expectations: α_1 is expected to be negative as the year progresses with proper implementation of the policy supported with necessary enforcement; $\alpha 2$ is expected to be negative to indicate that the policy has been able to reduce yearly importation of wheat.

The probit regression was used to determine the factors influencing the willingness to use composite flour that contains HQCF by respondents. The model is given as shown in Equation 3:

$$\begin{aligned} WTU = \partial_0 + \partial_1 ACC + \partial_2 TRA + \partial_3 AVS + \partial_4 QTY + \partial_5 AGE + \partial_6 GEN \\ + \partial_7 EXP + \partial_8 HHS + \partial_9 MST + \partial_{10} PRF + \partial_{11} TOS + \varphi \end{aligned} \qquad (3)$$

$$WTU = \begin{cases} 1 \ if \ WTU > 0 \\ 0 \ otherwise \end{cases}$$

Where:

WTU is the dependent variable, which represents the probability of respondents' willingness to use HQCF.

∂_0, ∂_1, ∂_2, ∂_3, ⋯ , ∂_{11} are coefficients that will be estimated while examining the factors affecting respondents' willingness to use HQCF.

φ is the residual term.

ACC represents access to composite flour that contains HQCF (Access=1, Lack of access=0).

TRA represents access to training and information on the use of composite flour that contains HQCF (Trained=1, Not trained=0).

AVS represents average sales revenue of the respondent (₦) per month.

QTY represents quantity of HQCF in the composite flour used (in Kg) per batch.

AGE represents age of the respondent (in years).

GEN represents sex of the respondent (Male=1, Female=0).

EXP represents business experience of the respondents (in years).

HHS represents household size of the respondents (in persons).

MST represents marital status of the respondent (Married=1, Single=0).

PRF represents preference for HQCF (Yes=1, No=0).

YOS represents year of schooling of the respondent (in years).

4. RESULTS AND DISCUSSIONS

4.1. Socio- Economic Characteristics of Bread and other Confectioneries Producers

The result shows that majority (98.0%) of the bread producers were male while majority (86.9%) of other confectioneries producers were female Table 1.The exclusiveness of bread baking to male may be as a result of high level of physical strength required in bread production among the small scale producers that still adopt old technology. The average age of bread producers was 43.8 years with the skewness been positive (0.8) indicating that majority of the bread producers were below the average age. The average age of other confectioneries producers was 37.0 years with the skewness 0.7. This also indicates that majority of the other confectionery producers were below 37.0 years. These indicate that the producers (bread and other confectioneries) were in their economic active age. More than eighty eight percent (88.2%) of the bread producers were married while 71.2% of the other confectionery producers were married with the average household size of 4.2 and 3.5 respectively. Also, 51.0% and 63.3% of the bread producers and other confectioneries producers respectively had at least NCE/OND. The average years of experience for bread producers and other confectioneries producers were 13.5 and 7.4 years respectively.

As a way of encouraging the use of composite flour, the need for training on how to use as well as creating selling points are very important. Figure 2 shows that 57.0% of the bread producers and 56.0% of other confectioneries producers had access to composite flour that contains HQCF while 48.0% and 22.0% of the bread producers and other confectioneries producers had training on the use of HQCF. The study revealed that only 42.0% of the bread producers and 14.0% of the other confectioneries producers were willing to use HQCF. This shows that most of the respondents were not willing to use composite flour.

Table-1. Socio-economic characteristics of the respondents.

Characteristics	Bread producers		Other confectionery producers	
	Frequency	Percentage	Frequency	Percentage
Gender				
Male	100	98.0	20	13.1
Female	2	2.0	133	86.9
Age				
18 – 27	3	2.9	24	15.7
28-37	22	21.6	71	46.4
38-47	52	51.0	39	25.5
48-57	17	16.7	14	9.2
58-67	6	5.9	5	3.3
68-77	1	1.0	0	0
78 years and above	1	1.0	0	0
Mean	43.8		37.0	
Skewness	0.80		0.7	
Marital status				
Married	90	88.2	109	71.2
Single	12	11.8	44	28.8
Household size				
1-3	41	40.2	87	56.9
4-6	47	46.1	58	37.9
7-9	13	12.7	5	3.3
10-12	0	0	2	1.3
13 and above	1	1.0	1	0.7
Mean	4.3		3.5	
Standard deviation	2.3		1.9	
Highest educational status				
No formal education	0	0	4	2.6
Primary school	13	12.7	7	4.6
Secondary school	37	36.3	45	29.4
OND/NCE	30	29.4	53	34.6
BSc/HND	21	20.6	34	22.2
Msc	1	1.0	10	6.5
Years of experience in confectionery business				
1-3	2	2.0	28	18.3
4-6	17	16.7	62	40.5
7-10	29	28.4	44	28.8
11-13	9	8.8	4	2.6
14-16	17	16.7	7	4.6
17-20	17	16.7	5	3.3
21 years and above	11	10.8	3	2.0
Mean	13.5		7.4	
Skewness	1.4		2.3	

Source: Field survey (2017).

This could be attributed to failure on the part of government to enforce the policy on the production of composite flour that contains HQCF by flour millers. The failure of the policy to reduce wheat importation is confirmed by the significant and positive relationship between wheat importation and the dummy that represents the composite flour policy periods. The non-users of the composite flour spoilt market for the users using propaganda on its health hazards in bread on consumers. Furthermore, the result shows that 99.0% and 92.2% of the bread producers and other confectionery producers were aware of composite flour respectively. Moreover, 36.0%, 26.2% and 19.1% of the respondents were aware of composite flour through mass media, friends and International Institute for Tropical Agriculture, respectively.

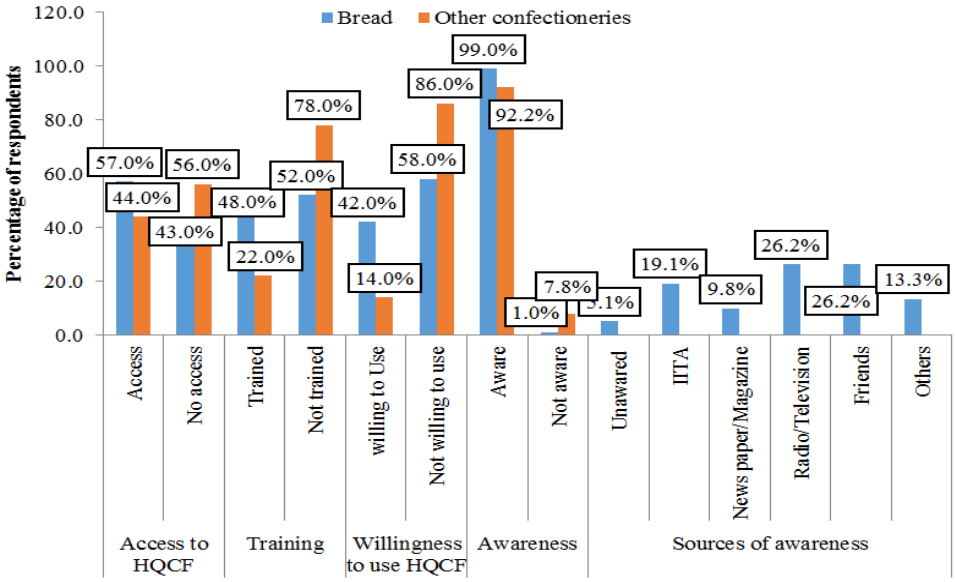

Figure-2. Distribution of the respondents on characteristics relative to HQCF.
Source: Field survey (2017).

The study showed that among the respondents that were using composite flour, the bread producers purchased the product in larger quantities (bags) unlike the other confectioneries producers who bought in 'kongos'[2] and cups. The distribution of the quantities and amount spent on composite flour that contains HQCF by the bread and other confectioneries producers per kg per production are shown in Table 2. The breakdown shows that the bread producers used composite flour at an average of 73.8kg of HQCF at the average cost of ₦20,674.4 per production while the other confectioneries producers used an average of 1.4kg at an average cost of ₦403.2 per production.

Table-2. Quantity of HQCF used and amount spent on HQCF by bread other confectioneries producers per production.

Bread producers			Other confectioneries producers		
Categories	**Frequency**	**Percentage**	**Categories**	**Frequency**	**Percentage**
Quantity (kg)				Quantity (kg)	
0 – 50	86	84.3	0 - 1.0	140	91.5
51 – 150	14	13.7	1.1 - 1.5	7	4.6
151 and above	2	2.0	1.6 & above	6	3.9
Total	102	100.0	Total	153	100.0
Mean	73.8		Mean	1.4	
Skewness	2.0		Skewness	4.0	
Amount (₦)				Amount (₦)	
0 – 7000	63	61.8	0 – 200	140	91.5
14000 – 21000	24	23.5	201 – 500	7	4.6
28000 – 70000	15	14.7	501 & above	6	3.9
Total	102	100.0	Total	153	100.0
Mean	20674.4		Mean	403.2	
Skewness	2.0		Skewness	4.0	

Source: Field survey (2017).

Table 3a and Table 3b show that the average sales per production for bread and other confectionaries producers using composite flour and whole wheat flour. The average revenue of bread producer using whole wheat was higher than the users of composite flour Table 3a. This may be attributed to propaganda being used to

[2]It should be noted that 1 'Kongo' of HQCF = 1.2Kg while 1bag =50kg.

discourage the consumption of bread made from composite flour. However, the average sale of the other confectioneries producers was higher than the whole wheat flour users Table 3b.

Table-3a. Distribution of sale per production of bread producers using composite flour and whole wheat flour.

Sales (₦) per production	Composite flour users		Whole wheat flour users	
	Frequency	Percentage	Frequency	Percentage
Less than 50,000	4	9.3	13	22.0
50,001 - 100,000	18	41.9	20	33.9
100,001- 200,000	16	37.2	15	25.4
200,001 - 300,000	1	2.3	4	6.8
300,001 - 400,000	4	9.3	5	8.5
500,001 and above	0	0.0	2	3.4
Total	43	100	59	100
Mean	₦126,549.8		₦503,912.5	
Skewness	1.4		7.7	

Source: Field survey (2017).

Table-3b. Distribution of sale (₦) per production of other confectioneries producers using composite flour and whole wheat flour.

Sales (₦) per production	Composite flour users		Whole wheat flour users	
	Frequency	Percentage	Frequency	Percentage
At most 20,000	8	38.1	72	54.5
20,001 - 40,000	2	9.5	24	18.2
40,001 - 60,000	2	9.5	11	8.3
60,001 - 80,000	4	19.0	9	6.8
80,001 - 100,000	4	19.0	7	5.3
100,001 and above	1	4.8	9	6.8
Total	21	100	132	100
Mean	₦47,638.10		₦33, 420.08	
Skewness	1.1		2	

Source: Field survey (2017).

The multiple regression result in Table 4 shows that 86% variation in the quantity of wheat imported is caused by the period and the composite flour policy. There was overall significance of the model ($F = 191.11$, $p<0.000$). The coefficients of period and composite flour policy were significant and positive. This means that for every succeeding year, the quantity of wheat to be imported will increase by 51.72('000MT). Also, with the composite flour policy in place, the quantity of flour to be imported will increase by 1728.99(MT). The positive sign of the coefficient of the composite flour policy means that the policy had positive effect on the wheat importation. This is an indication that the composite flour policy has failed.

Table-4. Multiple regression result

	Coefficients	Standard error	z-value	p-value
Intercept	-253.71	173.64	-1.46	0.149
Period (year)	51.72	6.28	8.23	0.000
Composite flour policy	1728.99	264.09	6.547	0.000

R-2 = 0.86, F = 191.11 ($p<0.01$).

4.2. Preference for HQCF

Table 5 shows that 27.5% and 20.9% of the bread and other confectioneries producers respectively preferred composite flour to a great extent while 15.7% (bread producer) and 17.0% (other confectioneries producers) preferred composite flour to a very little extent. Also, 24.5% of the bread producers and 20.3% of the other confectioneries producers had no preference for composite flour. From the foregoing, a lot is still required on the sensitization of bread and other confectioneries producers on the importance of composite flour to their business and the economy in general. Enforcing the flour millers to comply with the policy will bring about success in the sensitization of users of composite flour.

Table-5. Level of preference for flour (wheat and HQCF) used by the respondents.

Preference level	Bread producers		Other confectioneries producers	
	Frequency	Percentage	Frequency	Percentage
To a great extent	28	27.5	32	20.9
Somewhat	33	32.4	64	41.8
Very little extent	16	15.7	26	17.0
Not at all	25	24.5	31	20.3
Total	102	100.0	153	100.0

Source: Field survey (2017).

Cost of raw material plays a significant role in determining the profit margin of a producer and by extension the choice of raw material used in production; all things being equal. Most especially the cost of the major raw material used in production like flour in bread and other confectioneries production. Table 6 shows that there was significant difference in the average cost of composite flour and whole wheat flour for the bread producers ($p<0.05$) and other confectioneries producers ($p<0.01$). These imply that lesser costs were incurred on composite flour that contains HQCF by users in the study area. This is expected to have brought about massive utilization of composite flour by bread and other confectioneries producers. However, this has not being the case. This may not be unconnected with unsubstantiated propaganda of the quality of composite flour products by most users of whole wheat flour. The flour millers, bread and other confectioneries producers are capitalizing on poor enforcement of the policy on composite flour production and usage by government. There was also significant different between the average quantities of wheat imported before and when the policy was in place ($p<0.01$). The average quantities of wheat imported when the composite flour policy was in place was higher.

Table-6. Equality test results.

Flour users	Composite flour that contains HQCF		Whole wheat flour		Zcal	P-value
	Mean	Sd	Mean	Sd		
Bread producers	27722.77	40554.85	81346.54	254496.60	-2.09	0.036**
Other confectioneries producers	171.40	506.41	1504.53	1549.27	-10.12	0.000***
Variable	Before introduction of policy (Number of yeas = 47)		When the policy was in place (Number of years = 13)			
	Mean	Sd	Mean	Sd	Zcal	p-value
Wheat importation ('000MT)	987.53	906.13	4268.08	690.04	14.10	0.000

Source: Result of data analysis (2015).
Note: ** represents significant at 5%, and *** represents significant at 1%.

4.3. Determinants of Willingness to use Composite Flour that Contains HQCF

4.3.1. Bread Producers

The probit result in Table 7 shows that the log likelihood ratio (79.40) was significant ($p < 0.01$). This indicates that the model has a good fit, with moderately high pseudo R2 value of 0.57. Out of seven dependent variables considered for the analysis, the coefficients of four (preference for HQCF, access to HQCF, sales revenue and years of experience in bread production) significantly influenced the respondents willingness to use composite flour that contains HQCF. The coefficients of preference for composite flour, access to composite flour, years of experience in bread production were significant and positively influenced the probability of the bread producers' willingness to use composite flour by the bread producers. Specifically, the probabilities of willingness to use composite flour increased by 16%, 51% and 1% for preference for composite flour, access to composite flour and years of experience in bread production respectively. The significance of years of experience in bread production may be attributed to the fact that bread producers with higher level of experience have better understanding of using composite flour that contains HQCF and will be more willing to use it. This result is in agreement with the findings of Etim and Benson [32]. Sales revenue (₦) per production was significant but negatively influenced the probability of the bread producers' willingness to use composite flour by the bread producers by 0.0000625%.This corresponds with the findings of Olarewaju, et al. [31] that revealed that increase in income increases willingness to pay.

Table-7. Probit regression result for bread producers.

Variables	Coefficients	Marginal effect	Z	p- value
Age	0.02 (0.03)	0.01 (0.01)	0.76	0.45
Year of schooling of respondent	0.06 (0.07)	0.01 (0.01)	0.95	0.34
Preference for composite flour	0.98 (0.50)	0.16 (0.08)	2.01	0.05**
Access to HQCF	3.03 (0.57)	0.51 (0.05)	11.00	0.00***
Sales revenue (₦) from baking	-3.73×10^{-07} (2.09×10^{-07})	-6.25×10^{-07}(3.36×10^{-07})	-1.86	0.06*
Experience in baking (year)	0.05 (0.03)	0.01(0.01)	1.73	0.08*
Household size of respondent	-0.10 (0.11)	-0.02 (0.02)	-0.96	0.34
Marital status of respondent	-0.03 (0.63)	-0.05 (0.11)	-0.05	0.96
Constant	-4.53 (1.61)	-	-2.82	0.01***

Pseudo R^2=0.57, LR chi^2=79.40, Prob>chi2 =0.00.
Note: *, ** and *** means significant at 10%, 5% and 1% respectively.
Source: Field survey (2017).

4.3.2. Other Confectioneries Producers

The Probit result indicated in Table 8 shows that the log likelihood ratio of 46.59 was significant ($p < 0.01$) which indicated that the model has a good fit, with high pseudo R2 value of 0.61. This means that 61% variation in willingness to use composite flour was explained by age of respondent, sex of respondent, participation in training and experience in baking. The result shows that out of eight independent variables considered for the analysis, the coefficients of four variables (age of respondent, sex of respondent, participation in training and experience in baking) significantly influenced the willingness of other confectioneries (egg roll, doughnut, sausages, meat pie and fish pie among others to use composite flour that contains HQCF. Age of respondents negatively influenced the willingness of other confectioneries to use composite flour. This agrees with the findings of Adepoju and O. [23]; Etim and Benson [32] and Dompreh [40] which revealed that age influence willingness to use an item. However, the coefficients of sex of respondent, participation in training and experience in baking positively influenced willingness to use composite flour. The result on participation in training agrees with Gervès-Pinquié, et al. [37] that training increases willingness to use a product but disagrees with Sellers-Rubio and Nicolau-Gonzalbez [36] who stated that the increase in knowledge decreases the likelihood of using a product.

Table-8. Probit regression result for other confectioneries producers.

Variables	Coefficients	Marginal effect	Z	p - value
Age of respondent	-0.09 (0.05)	-0.01 (0.01)	-2.05	0.04**
Year of schooling	-0.15 (0.13)	-0.02 (0.02)	-1.28	0.20
Sex of respondent	2.55 (1.22)	0.36 (0.15)	2.46	0.01***
Participation in training	3.47 (0.99)	0.49 (0.08)	6.54	0.00***
Sales revenue (₦) from baking	-9.45e-06 (7.27e-06)	-1.33e-06 (9.95e-07)	-1.34	0.18
Experience in baking (year)	0.26 (0.10)	0.04 (0.01)	3.33	0.00***
Household size of respondent	0.20 (0.19)	-0.03 (0.03)	1.07	0.28
Marital status of respondent	0.36 (0.81)	0.05 (0.11)	0□45	0.65
Constant	0.32 (2.22)	-	0.14	0.89

Pseudo R^2=0.61, LR chi^2 = 46.59, Prob>chi2 =0.00.
Note: *, ** and *** means significant at 10%, 5% and 1% respectively.
Source: Field survey (2017).

5. CONCLUSION AND RECOMMENDATIONS

The study showed low willingness to use composite flour among bread and other confectioneries producers. However, the bread producers showed appreciably higher willingness than the producers of other confectioneries despite significant reduction in the average cost incurred on composite flour compared to whole wheat flour. The failure of the composite flour policy was confirmed by its positive effect on the wheat importation. Access to composite flour and sales revenue influenced willingness to use composite flour by bread producers while age and participation in training were factors that influenced willingness to use composite flour by other confectioneries producers. Enforcement of the policy on the flour millers to produce composite flour by government coupled with enlightenment and intensive training on the use of composite flour that contains HQCF would help raise the willingness to use composite flours among bread and other confectioneries producers.

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