SOCIO-ECONOMIC ANALYSIS OF *AGIDI* PRODUCTION IN OYO STATE, NIGERIA

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Abstract: Maize is among the primary food staples and its consumption is widespread across Nigeria irrespective of household wealth. It is widely used in the preparation of traditional foods. *Agidi*, a thick gel produced from fermented maize paste or flour, is a common traditional food in some West African countries including Nigeria. This study investigated the socio-economic characteristics of *agidi* producers/sellers and the profitability of *agidi* production using Afijio and Ojongbodu Local Goverenment Areas (LGAs) as case study. Sixty *agidi* producers from the two LGAs were randomly selected and interviewed using an open-ended questionnaire to obtain information from the respondents. Descriptive statistics and budgetary technique were the tools employed for data analysis. The results revealed that *agidi* production is female dominated (100 percent) and a good percentage (64 percent) of the respondents practise Islam as religion. Also, the result showed net production income with a loss of about ₦585,891.11k in revenue which indicates that the respondents in the study areas have been recording loss in *agidi* enterprise. It is therefore, recommended that *agidi* producers should be organised to form cooperative/credit society to enable them have access credit and also help them dictate the product price towards profit generation.

Keywords: Afijio, *Agidi*, characteristics, profitability, Ojongbodu, socio-economic

Introduction

Major cereals grown in Africa include maize, rice, sorghum and millet. Cereals are more widely utilized as food in African countries, than in the developed world. In fact, cereals account for as much as 77% of total caloric consumption in African countries (Mkpado, 2013), and contribute substantially to dietary protein intake in a number of these countries. A majority of traditional cereal-based foods consumed in Nigeria are processed by natural fermentation. Fermented cereals are mostly used as weaning foods for infants as well as dietary staples for adults in most part of Africa (Mkpado, 2013).

Nigeria is the tenth largest producer of maize in the world, and the largest maize producer in Africa, followed by South Africa (Cadoni and Angelucci, 2013). Maize is, on average, the 5th most produced agricultural commodity in the period of 2005-2010, becoming the 3rd most produced crop (by quantity) in the country during 2009 and 2010, after cassava and yams. (Cadoni and Angelucci, 2013). Most of the production aims to the domestic market, since a negligible part of the production is formally exported (Cadoni and Angelucci, 2013). It is the fourth most consumed cereal during the past two decades, below sorghum, millet and rice (Cadoni and Angelucci, 2013). However, it is the most frequently consumed food staple in Nigeria (IITA, 2003).

Being among the primary food staples, maize consumption is widespread across the country and among households of different wealth. It is widely used in the preparation of traditional foods. *Agidi*, a thick gel produced from fermented maize paste or flour, is a common traditional food in some West African countries, including Nigeria (Otunola *et al.*, 2006, 2007; Osungbaro *et al.*, 2009; Ikya *et al*., 2013). Its preparation involves the stirring of *ogi* paste in hot water over fire and stirring until a gel is formed. The cold gel is thereafter wrapped in leaves such as *ewe eran*. The consumption of *agidi* cuts across all economic classes of people, sex and age groups.

However, it is commonly consumed by the vulnerable group, including children and elderly. It is consumed along with such traditional foods as *akara* and *moinmoin* (Zakari *et al*., 2010).

Agidi production and marketing are prominient economic activities among the Yorubas in south-west Nigeria. Despite the high level of consumption of this product, the sellers are not economically well-off, and this may not encourage the younger generation into the business. Various aspects of *agidi* such as nutrient composition, supplementation and safety have been reported in the literature (Otunola *et al.*, 2006; Dike and Sanni, 2010; Zakari *et al.* 2010; Ikya *et al*, 2013). However, report on the economic analysis of *agidi* is scanty.

This study therefore investigated the socio-economic characteristics of *agidi* producers/sellers and the profitability of *agidi* production using Afijio and Ojongbodu local government areas of Oyo State as case study.

Materials and Methods

Data collection and sampling techniques

Oyo state was purposively selected for this study due to the high level of *Agidi* consumption by most of the indigenes of the state. Two local government areas (Afijo and Ojongbodu LGAs) were randomly selected among all the local government areas in the state for the study. Sixty (60) *agidi* producers (30 producers from each local government area), were randomly selected and interviewed personally by the researchers to ensure high quality data, using an open-ended questionnaire to obtain information from the respondents. Only fifty-two (52) of the questionnaires were found useful, as eight (8) of them did not give adequate information for the purpose of this study.

Method of data analysis

Descriptive techniques (frequencies and percentages) and budgetary technique were used to analyse the data collected from the study area. Descriptive statistics were used to describe the socio-economic characteristics of the respondents, best time of sales, colours of maize used in production, number of wraps consumed out of their production and number of sales (wraps) per day, while the budgetary technique was used to determine the costs and returns (profitability) of *agidi* production in the study area. The costs and returns analysis were calculated using the

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following models (Oke, 2014; Adeniyi *et al.* 2015; Raoul *et al.,* 2015):

$$GMI = \Sigma TR - \Sigma TVC$$
$$TR = P_y (Y_i)$$
$$TVC = P_{xi} (X)$$
$$TC = TVC + TFC$$
$$NPI = GM - TFC$$
$$ESR = TFC/TC$$
$$GR = TC/TR$$

Where: GMI = Gross Margin Income (₦); TR = Total Revenue (₦); TVC = Total Variable Cost (₦); TFC = Total Fixed Cost (₦); TC =Total Cost (₦); NPI = Net Production Income (₦); P_y = Unit Price of Output Produced (₦); Y = Quantity of Output (Wraps); P_{xi} = Unit Price of Variable input *i* used (₦); X_i = Quantity of Variable Input *i* (kg); GR = Gross Ratio; ESR =Expenses Structure Ratio

Depreciation values of fixed items used in *agidi* production, such as iron pots, iron buckets, wooden spatula, baskets, trays and bowls, were used for calculation. Straight Line Method (SLM), which assumed salvage value of zero was used and the items (such as iron pots and iron buckets) are expected to spend a minimum of 18 years, while other small utensils (such as bowls, baskets, plastic buckets, etc.) are expected to serve for a minimum of 2 years. Depreciation is calculated using the formula specified as:

$$D = \frac{P_o - S}{n}$$

Where: D = Annual depreciation; P_o = Original Price/Cost; S = Salvage Value; n = Expected no of Years or Useful Life Span (year)

Breakeven analysis informs producers about the price they need to receive for their product in order to cover all costs of production. In other words, it indicates the unit price needed to be charged for *agidi* in order to cover total costs of production.
Breakeven analysis was achieved using the following formula:

$$\text{Breakeven Point} = \frac{Total\ Cost\ of\ Production}{Quantity\ of\ agidi\ Produced}$$

Results and Discussion
The age distribution of the respondents (Table 1) revealed that about 46 percent of the respondents are still in their active age of between 40 and 49 years followed by older age groups of between 50 and 59 years and above 60 years representing about 28 percent and 15.4 percent, respectively. The result reflects the modal age of the respondents to be 45 years. As shown in Table 2, it can be deduced that *agidi* enterprise does not interest younger generation in the study area as only 9.6 percent of the respondents belong to the younger age group of 20-39 years. The sex distribution of the respondents showed that all the people that are involved in *agidi* production in the study area are all females. This could be due to the fact that most men are not interested in anything that involved kitchen or food that is prepared or cooked mostly by firewood.
The result revealed that the study area was a Muslim-dominated community as majority of the respondents, representing about 64 percent, practise Islam as religion while 36.5 percent of the respondents are Christians. None of the respondents agreed to practising any other religion. The highest level of education attained by the respondents is secondary school. 25 percent of the respondents had secondary education while about 46 percent had primary education. 28.8 percent represented the respondents who never had the opportunity of attending school at all. The household size distribution of the respondents reflects that majority of the respondents have average large family size of between 5 and 7 family members and this represents about

63.5 percent of the respondents while only 5.8 percent of the respondents had eight and above household size. Respondents with a moderate household size of 2-4 were about 30.8 percent in the study area.

Table 1: Socio-economic characteristics of the respondents

Variable	Freq.	%
Age Distribution		
20-39	5	9.6
40-49	24	46.2
50-59	15	28.8
60 & above	8	15.4
Total	*52*	*100.0*
Sex Distribution		
Female	52	100.0
Male	0	0.0
Total	*52*	*100.0*
Religion Distribution		
Christians	19	36.5
Muslims	33	63.5
Total	*52*	*100.0*
Level of Education Distribution		
Secondary School	13	25.0
Primary Education	24	46.2
No formal education	15	28.8
Total	*52*	*100.0*
Secondary Occupation Distribution		
Farming	9	17.3
Trading	17	32.7
None	26	50.0
Total	*52*	*100.0*
Household Size Distribution		
2-4	16	30.8
5-7	33	63.5
8 & above	3	5.8
Total	*52*	*100.0*
Year of Experience Distribution		
Less than 10	5	9.6
10-20	22	42.3
21-30	12	23.1
31-40	9	17.3
41-50	4	7.7
Total	*52*	*100.0*
Household monthly income		
Less than 10,000	2	3.8
10,000-30,000	8	15.4
31,000-50,000	27	51.9
51,000-70,000	12	23.1
71,000-90,000	3	5.8
Total	*52*	*100.0*
Membership of cooperative society		
Yes	13	25.0
No	39	75.0
Total	*52*	*100.0*

The result of years of experience in *agidi* production as revealed in Table 1 shows that majority of the respondents in the study area had nothing less than ten years experience in the enterprise as modal years of experience revealed to be 20 years. About 42 percent of them had between 10-20 years experience in the business followed by respondents with between 21-30 years of experience, representing about 23 percent. Just few respondents, about 9.6 percent had less than ten years experience in the business of *agidi* production. With good years of experience among *agidi* producers and sellers, it is surprising to discover that majority of them (75 per cent) did not belong to any credit or cooperative society which could help them access fund to increase production and/or increase product unit price to maximise profit. This cannot but be associated with the respondents' low level of education, thereby making them to lack the understanding that forming a

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credible cooperative society could help them influence product price towards profit generation and also have access to credit facilities as a group within their local government areas.

With respect to the distribution of household monthly income of the respondents, 27 of the respondents (51.9 percent) had an average household monthly income ranging between N31,000-N50,000 followed by about 23 percent of respondents having monthly income class of between N51,000-N70,000. Just about 3.8 percent and 5.8 percent of the respondents are earning less than N10,000 and between N71,000-N90,000 in their household, respectively. The respondents with household income of over N50,000 may actually belong to those who have some other business (secondary occupation) along with *agidi* enterprise and/or those respondents whose spouse earn a reasonable amount from their work to support the family.

The result in Table 2 shows the average quantity of maize that most of *agidi* producers processed per day in the study areas. Higher percentage of the respondents (about 73 percent) processed between 10-20 kg of maize per day while about 21 percent and 5.8 percent processed less than 10 kg and a range between 21-30 kg, respectively. Most people that processed lesser quantity are mostly people of older age who could not withstand much stress that go along with *agidi* production and some few who have secondary occupation to support the revenues from *agidi* enterprise.

Table 2: Maize (kg) processed per day by the respondents

Range (kg)	Frequency	Percent
Less than 10	11	21.2
10-20	38	73.1
21-30	3	5.8
Total	52	100.0

Table 3: Volume of *agidi* wraps produced and amount of sales/day

Range	Frequency	%
Less than 200	5	9.6
200-400	20	38.5
401-600	15	28.8
601-800	9	17.3
801-1000	3	5.8
Total	*52*	*100.0*

Amount of sales/day (₦)	*Frequency*	*%*
Less than 1,000	1	1.9
1,000-3,000	18	34.6
3,100-5,000	21	40.4
5,100-7,000	9	17.3
Above 7,000	3	5.8
Total	*52*	*100.0*

Table 3 shows the volume of *agidi* produced and amount of sales by the respondents per day. A wrap of *agidi* goes for ₦10.00k and just a meagre population (5.8 percent) of the respondents produced between the range of 801-1000 pieces of *agidi* and the same percentage sold about ₦7,000 and above everyday in the study area. 9.6 percent were producing less than 200 wraps per day while majority of the respondents produced between the ranges of 200-400 and 401-600 pieces of *agidi*, representing about 38 percent and 28.8percent respectively. The result further showed that about 40 percent and 34.6 percent of the respondents made an average sale of between the ranges of ₦3100 - ₦5000 and ₦1,000 - ₦3000 each day, respectively. Most of the respondents accepted that they also fed and give part of their production as gift to friends or visitors. Table 4 shows the amount of *agidi* wraps

that are either consumed by the respondents' households or given as gift to friends and visitors. Only 15 (28.8 percent) of the respondents took a deliberate decision that *agidi* production is a business and hence, neither home consumption nor free gift took place in any of their production for business while the rest of them either feed their family members or give *agidi* as gift to friends from their main production. A huge percentage of about 54 percent of the respondents consumed (or give out as gift) a number of *agidi* wraps ranging between 1-30 pieces per day, while about 17 percent consumed much more. Very few (if any) business can survive and also bring revenue in this kind of scenario.

When the time of best sales of *agidi* was asked, majority of the respondents (about 71 percent) agreed that evening period is the best time of sales while 26.9 percent agreed that morning period bring best sales. As shown in Table 5, afternoon sales is highly negligible and it can be advised based on this result that prospective *agidi* producers should target evening market for optimum sale.

Table 4: Amount of *agidi* wraps consumed or given as gift/day by the respondents

Range	Frequency	Percentage
None	15	28.8
1-10	17	32.7
11-30	11	21.2
31-40	5	9.6
41 & above	4	7.7
Total	**52**	**100.0**

Table 5: Time of best sales

Period of the day	Frequency	Percentage
Afternoon	1	1.9
Evening	37	71.2
Morning	14	26.9
Total	**52**	**100.0**

Table 6: Maize colour used in production

Variable	Frequency	Percentage
Sole white	50	96.2
Sole yellow	2	3.8
Total	**52**	**100.0**

Source: *Field Survey,* 2016

Table 6 shows result for type of maize colour the producers used in producing *agidi*. It was surprising to discover that the percentage of respondents who agreed to use yellow maize for production was meagre while about 96 percent of the respondents agreed to be using sole white maize for *agidi* production. This implies there is still a great need by researchers, extension agents and other stakeholders to intensify effort to educate this class of people the benefit of using carotene fortified maize (yellow maize) in production of *agidi* for better eye sight and other nutritional benefits.

Table 7 shows the profitability analysis of *agidi* enterprise in the study areas. The result of the total revenue of the respondents was ₦215,510:00k, though, a wrap of *agidi* goes for ₦10 per wrap. The total fixed cost for the enterprise was calculated to be ₦647,111:11k (depreciated value). All the respondents purchased maize that worth over ₦77,770:00k in a month while the costs of other materials (such as firewood, kerosene, matches, nylons, leaves '*ewe-iran*', palm kernel shell and estimated cost of water, etc) were calculated to sum up to ₦46,070. The respondents did not consider paying themselves in the business and hence, they assumed the cost of labour was free. An estimated cost of labour is valued to be ₦30450:00k, based on the information that could be gotten

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from the respondents on the worth of labour in such enterprise in the study areas.

Table 7: Cost and Returns Analysis of *Agidi* Production

Item	Total Values (₦)
Total Revenue	215,510
Total Fixed Costs, TFC (Iron pots, Bowls, Trays, Buckets, wooden spatula and Baskets)	647,111.11
Variable Costs	
Labour	30,450
Maize (Kg)	77,770
Other input materials	46,070
Total Variable Costs (TVC)	154,290
Total Cost (TC)	801,401.11
Gross Margin Income	61,220
Net Production Income	-585891.11
Expenses Structure Ratio	0.80
Breakeven price	37.19

Based on the values of total revenue, total cost and total variable cost, the gross margin, gross ratio and net production income of the enterprise were calculated. The gross margin was ₦61,220:00k while the net production income estimated indicates a marginal loss of about ₦585,891.11k in revenue. This result indicates that the respondents in the study areas have been recording loss in *agidi* business unknowingly and they have just been striving to keep up with the business. Although, the potential to breakeven with increase in production is very high each piece of the product should not be sold at any price lesser than ₦37.19k to achieve this. The breakeven point represents the sales amount in either unit or revenue terms that is required to cover total costs (both fixed and variable). In other words, it is the price at which the product must be sold in order for profit to be zero. Any price set above the breakeven price of ₦37.19k will result to profit. The Expenses Structure Ratio (ESR) value of 0.80 indicates that fixed cost accounted for about 80% of the total cost incurred in *agidi* enterprise in the study areas. This could be one of the major reasons for the inability of *agidi* producers to breakeven as all the costs incurred could not be recovered in the first year of production. Although, it is expected that the loss in the enterprise will be drastically reducing after the first year as no much fixed inputs is expected to be purchased.

Conclusion

It is concluded from the study that *agidi* production business is an unprofitable enterprise in the study areas as the net production income revealed a loss of about ₦ -585,891.11k for the producers/sellers.

It is recommended that *agidi* producers should form a well organised and creditable cooperative society which could help them access fund from the local credit facilities, buy inputs in bulk to cut production costs and also to influence their product price towards profit maximization.

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