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ANALYSIS OF FISH FEED MARKETING IN IKEJA LOCAL GOVERNMENT AREA, LAGOS STATE NIGERIA

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Abstract

This study analyzed marketing of fish feeds in Ikeja, Local Government Area (LGA) of Lagos State, Nigeria. The study described socioeconomic characteristics of the marketers, identified distribution channels, determined marketing margins and efficiencies of the feed marketers, compared their profits and determined factors influencing supplies of fish feeds in the area by feed millers and the marketers. Primary data were gathered with structured questionnaires from 21 fish feed mills and from 84 fish feed marketers (63 fish feed retailers and 21 fish feed wholesalers) and analyzed with descriptive and Inferential statistical methods. Fish feed wholesalers posted a relatively higher monthly marketing margin and marketing efficiency than the retailers. In terms of profitability the fish feed retailers posted a higher Gross margin per kilogram of unbranded fish feed sold than the wholesalers. The OLS estimates revealed that supply of fish feed by wholesalers is positively influenced by price of the feed, cost of transportation, and access to credit but negatively influenced by cost of storage. To the retailers, the supply of fish feed was negatively influenced by unit cost of close substitute of fish feed (pelleted poultry feed), and daily charge of market toll. It was positively influenced by price of the fish feed, access to credit, and marketing experience. To encourage both wholesale and retail trade on fish feeds, Lagos State government should assist in bringing down transport costs; bankers should make fish feed traders have easy access to loans and landlords charge lower rents on old stalls and warehouses. Transportation costs can be reduced by subsidizing cost of fuel, providing cheap input delivery vans, and repairing damaged roads.

Key words**:** *marketing, fish feed, Ikeja, Nigeria*

INTRODUCTION

Fish farming is the rearing or production of fish in a controlled environment such as pond, cage, tank, irrigated canals, reservoirs and other types of enclosures [4]. In Nigeria production and supply have been on the increase in the last decade and demand for farmed fish is expected to continue to rise amidst soaring prices of imported fish and decline in capture fisheries [15]. Research has shown that the single most important input in fish farming is good quality fish feed, which represents 60-70 percent of the cost of operation [5, 18].

The fish feed industry in Nigeria is an important farm input subsector that has been developing to meet the demands of the country's fish farmers. It started with imported feeds and later local feed producers sprang up and started developing improved and cheaper feeds for the local fish farmers. The Lagos State government recently motivated fish farmers with free allocation of these feeds. Ordinarily, the fish feeds get to the farmers through the market system. Agricultural Marketing is concerned with all business activities that facilitate the movement of farm products or the inputs from the point of production until they are in the hands of consumers [12]. Fish feed marketing in a Ikeja area entails all business activities in moving formulated feeds from feed mills to fish farmers (processing, assembling, packaging/grading, transportation and storage/preservation). It also involves exchange, facilitating and institutional functions [13]. To analyze the marketing

performance of these fish feed stakeholders in Ikeja, Lagos Nigeria, this study described the socioeconomic characteristics and distribution; determined and compared fish feed marketing margins and efficiencies of the traders, estimated and compared the profitability of the trade and determined factors influencing supplies of fish feeds in the area.

MATERIALS AND METHODS

Study Area

This study was carried out in Ikeja Local Government Area (LGA) of Lagos State, Nigeria. Ikeja LGA with its headquarters in Alausa is located in southwestern part of Nigeria within Latitudes $6^0.36^/$ and 6^0 $62^/$ North of the Equator and Longitudes $3^0 21^/$ and 3^0 $35^/$ of the Greenwich Meridian. The study area ($49.92Km^2$) hosts 861,300 inhabitants [7]. Ikeja LGA is bounded in the North by Agege LGA, to the East by Shomolu LGA, to the South by Oshodi-Isololah and Mushin LGAs, and to the West by Alimosho LGA. Ikeja is home to a large Textile plant, wood seasoning plant and lot of manufacturing factories in foot wears, pharmaceuticals, plastics, paper and cork, ceramics, paints, livestock (feed mills) and light bulbs. Poultry farming, especially chicken egg production and fish farming for cheap protein predominates in Ikeja, Lagos State Nigeria.

Sampling Technique

This study employed both purposive and random sampling methods in selection of respondents and gathering of data. In sampling fish feed traders in Ikeja LGA, seven (7) nucleus popular locations was randomly chosen from ten (10) nucleus popular areas (Oregun, Ojodu, Opebi, Akiode, Alausa, Agidingbi, Magodo, Oba, Maryland, and Government Residential Area (GRA). The chosen locations are Oregun, Ojodu,, Akiode, Alausa, Agidingbi, Magodo, and Oba. Twelve fish feed traders (9 retailers and 3 wholesalers) were randomly selected from each of the seven chosen locations that gave a sample of 84 fish feed traders and 21 fish feed mills were involved in this study. This means that sixty-three (63) fish feed retailers, twenty-one (21) fish feed wholesalers and twenty-one fish feed millers were involved in this study.

Data Collection

Primary data were collected following a cross sectional survey using a semi-structured questionnaire. The questionnaire was administered on respondents using interview method. The data collected included socioeconomic characteristics of respondents, cost price of fish feed, selling price of fish feed, monthly quantity of fish feed bought, monthly quantity of fish feed sold, distribution route, unit trade prices, transportation cost, storage/stall charges, cost of packaging material(s), wages to casual and permanent purchasing and sales workers.

Analytical Technique

A combination of analytical tools was employed in data analysis. The socioeconomic characteristics of the marketers as analyzed descriptively with frequency distribution Table, means and percentages. Marketing margins was defined as the difference between the price paid to the first seller and that paid by the final buyer [1]. The marketing efficiency was determined with Shepherd-Futrell model and as used by [18]. We determined the factors influencing supplies of fish feeds by feed millers and marketers using the Ordinary Least Square (OLS) technique.

Model Specification

MMw = wP minus PP .....(1)

where:
MMw is Marketing Margin of wholesalers;
wP is wholesalers Price;
PP is Producers Price;

MMr = rP minus wP ..... (2)

where:
MMr is Marketing Margin of retailers;
rP is retail Price;
wP is wholesale Price.

The Shepherd Futrell model was specified as follows:

ME= Value added by Marketing/Total Marketing cost + Marketing Margin x 100 ….....(3)

where:
ME is Marketing efficiency.
Note:
(i)The value added by marketing was proxied by Net Returns from fish marketing activities [11];
(ii)Total marketing cost was proxied by cost of marketing activities.
(iii)Marketing cost is the sum of transport cost, storage cost, labour cost and other costs associated with moving the commodity from point of purchase to the next buyer or final consumer [12].
The Net returns was estimated following cost route model as follows:

Net Returns = TR minus TC.....(4)

where:
TR= Total revenue (Naira);
TC= Total Cost (Naira).
The implicit models of Ordinary Least Square techniques used were used to determine factors influencing supply of fish feed by feed millers and marketers in Ikeja, Lagos. The models were specified as follows:

$Y= F(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, ei)$ – **Feed Millers**.....(5)

where:
Y= Monthly Quantity fish feed supplied (Kg)
X_1 = Price per Kilogramme of raw materials (resource);
X_2 = Price of 25kg bag of produced fish feed (Naira);
X_3= Price of 25kg bag of poultry feed (close substitute) (Naira);
X_4= Feed transportation cost (Naira);
X_5= Annual Excise duty paid (Naira);
X_6=Annual cost of feed storage (Naira);
X_7= Annual depreciation of Machinery and Buildings (technology) (Naira);
X_8= Credit Access (Access=1; No Access=0);
e_i. =Stochastic error term.

$Y= F(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, ei)$- **Fish feed Traders**.....(6)

where:
Y= Monthly Quantity of fish feed supplied (Kg)
X_1 = Number of years of trading on fish feed (yrs);
X_2 = Price of 25kg bag of sold fish feed (Naira);
X_3= Price of 25kg bag of poultry feed in market (close substitute) (Naira);
X_4= Feed transportation cost (Naira);
X_5= Annual trading tax paid (Naira);
X_6=Annual cost of feed storage (Naira);
X_7= Other fish feeds trading costs (Packaging materials, rent on stalls);
X_8= Credit Access (Access=1; No Access=0);
e_i. =Stochastic error term.

RESULTS AND DISCUSSIONS

Socio-economic Characteristics of Fish Feed Marketers and Feed Distribution

Table 1 shows trade-related socioeconomic characteristics of fish feed traders in Ikeja, Lagos Nigeria.
The Table revealed that one-third each of wholesalers (33.33%) and retailers (34.92%) have traded on fish feed for between 6 and 10 years. The least proportions (9.52%) of the wholesalers and (11.11%) of retailers had at least 16 years and 21 years' fish feed trade experience respectively.
Further, more of the wholesale fish feed meal traders (57.14%) had access to credit than the retailers (31.75%) of the fish feed in the area. These proportions of the traders having access to credit suggest poor access and signify limited access to farm input trading credit. This conforms to the findings of Okonkwo (2013) on poultry feed marketing in Imo State, Nigeria and [10] on fish marketing in Ebonyi State, Nigeria. Improved access to credit enables marketers to increase marketing scale and derivable income.
[8] observed that credit facilitates adoption of innovations, creates opportunities, encourages capital formation, improves efficiency, leads to increased productivity and income.

Table 1 Distribution of Fish Feed Marketers By Trade-related Socio-economic Characteristics in Ikeja, Lagos Nigeria

Socioeconomic Characteristics	**Wholesalers**		**Retailers**	
Trading Experience (Years)	**Freq.**	**%**	**Freq.**	**%**
1 - 5	3	14.29	12	22.22
6 - 10	7	33.33	22	34.92
11- 15	6	28.57	9	14.29
16 -20	2	9.52	11	17.46
Above 21	3	14.29	7	11.11
Total	21	100.00	63	100.00
Mean	12.36		10.25	
Std. Dev.	4.44		3.61	
Access to Credit				
Yes	11	57.14	20	31.75
No	9	42.86	43	68.25
	21	100.00		100.00
Source of Operating Capital				
Personal Saving	17	80.95	59	93.65
Friends/Relatives	6	28.57	19	30.16
Cooperative societies	3	14.28	12	19.05
Local Money lenders	1	4.76	7	11.11
Commercial Banks	4	19.05	1	1.59
Microfinance Banks	8	38.10	9	14.29
Bank of Agriculture	1	4.76	3	4.76
	21	100.00	63	100.00

Source: Field Survey, 2019.

These socioeconomic characteristics facilitated fish feed distribution in the area such that fish feed millers sold the fish feeds to wholesalers, and the wholesalers sold to the relatively many retailers. The retailers in turn sold to fish farmers who use the feeds in feeding fishes in their various ponds. This is the major or popular route of fish feed delivery in the area. However, the fish millers sometimes under some agreements or public relation obligations or as part of their Corporate Social Responsibilities (CSR) sold fish feeds to retailers and fish farmers. The wholesalers on their part also sold some fish feed to fish farmers under similar agreements.

Marketing Margins and Marketing Efficiency of Fish Feed Marketers

The marketing margins in naira shared by the fish feed traders (wholesalers and retailers) and the marketing efficiency of the fish feeds in Ikeja as estimated was shown in Table 2.0. The marketing margins are the differences between the unit selling prices paid by the final buyer and the unit purchase prices paid by the marketer. Table 2.0 showed that the fish feed wholesalers earned ₦68.12 and the retailers earned ₦66.94 per kilogramme of fish feed transacted on. The marketing efficiency was ₦306.92 and ₦204.05 to wholesalers and retailers respectively. These values of efficiencies were very high indicating high profits to the traders at the expense of the fish farmers.

Marketing efficiency ratio should range from zero to infinity and figures less than 100.00% indicates inefficiency [14]. This means that more is spent on value-addition compared to the margin received after the value addition. A market efficiency ratio of 100.00% shows the market is perfectly efficient meaning that a price increment is just high enough to cover the cost of marketing. Where marketing efficiency value is greater than 100.00% it indicates excess profit for the marketers [3, 12, 16]. Table 2 revealed that the fish feed wholesalers had higher marketing efficiency than the retailers and could have achieved such by trading on larger monthly quantities of fish feed and had enjoyed relatively better economies of scale from the feed sales.

Table 2. Marketing Margins and Marketing Efficiency of Fish Feed Marketers in Ikeja, Lagos State, Nigeria

Margin Variable	**Wholesale Prices (₦)**	**Retail Prices (₦)**
Selling Price per kilogramme	358.32	425.31
Purchase Price per Kiligramme	290.25	358.37
Marketing Margin (Selling Price minus Purchase price)	**68.12**	**66.94**
Marketing efficiency (%)	**206.92**	**204.05**

Source: Own calculations, 2019.

Profitability of Trading on Fish Feeds by Marketers

The profitability of trading on fish feeds in Ikeja area was estimated and shown in Table 3.

The Table showed that some of the feed traders traded on branded feeds while others traded on unbranded fish feeds in the area. Recognizing this and adding the returns eventually, a mean revenue of ₦997,172.15, and variable cost of ₦823,685.93, was posted by the wholesalers while the retailers posted a mean revenue of ₦298,148.54, and variable cost of ₦256,417.67. These gave Gross

margins shares of ₦171,486.22 to wholesalers and ₦41,730.87 to the retailers. In their cost outlay, the wholesalers incurred total fixed costs of ₦31,925.22 and posted net returns of ₦139,561.00 while the retailers incurred total fixed costs of ₦139,561.00 and made Net returns of ₦33,061.26 from fish feed sales.

These computations showed that fish feed marketing in Ikeja was profitable to both the wholesalers and the retailers in the area. This finding corroborates with observations of [9] in Ahiazu Mbaise, Imo State Nigeria with respect to marketing of chicken poultry feeds. The chicken poultry and aqua culture fishes are fast growing and maturing enterprises that produce animal protein, consumed by many households. Inmates of households consuming these animal proteins are guaranteed food security and good health. These protein sources can be considered as farm product substitutes as market forces operate on them in similar forms and they obey economic theories as close substitutes in farm input markets.

Table 3. Profitability of Fish Feed Marketing in Ikeja, Nigeria

Items	**Wholesalers**			**Retailers**		
	Unit Cost (₦)	**Qty (Kg)**	**Value (₦)**	**Unit Cost (₦)**	**Qty (Kg)**	**Value (₦)**
A. **Revenue**						
Av. Selling price of branded fish feed	358.37	1,614.10	578,445.02	425.31	476.2	202,532.62
Av, Selling Price unbranded fish feed	310.12	1,315.21	418,727.13	380.47	251.31	95,615.92
Total Revenue(TR)			**997,172.15**			**298,148.54**
B. Variable Costs						
AV. Purchase price of branded fish feed	290.25	1,614.10	468,492.53	358.37	476.2	170,655.79
Av. Purchase Price of unbranded fish feed	238.51	1,,359.21	322,038.59	305.62	251.31	76,805.36
Transportation Cost			18,900.64			4,900.57
Labour(Loading/offloading)			11,499.09			3,000.10
Packaging Cost			4,755.08			1,055.85
Total Variable Cost (TVC)			**823,685.93**			**25,6417.67**
C. Gross Margin (GM)= TR-TVC			**171,486.22**			**41,730.87**
D. Fixed Costs						
Rent			18,200.7			5,208.80
Interest on loan						
Market Dues (Tax)			6,223.6			1,320.00
Asset Depreciation			2,400.02			1,020.21
			5,100.9			1,120.60
Total Fixed Cost (TFC)			**31,925.22**			**139,561.00**
Total Cost (TC)= TFC +TVC			**857,611.15**			**265,087.28**
Net Return= GM - TFC			**139,561.00**			**33,061.26**

Source: Own calculations, 2019.

Factors Influencing Supply of Fish Feeds By Marketers

Fish feed marketers (feed millers n=21, wholesalers n=21 and Retailers n=63) supplied fish feeds separately at different levels of the feed value chain. The Ordinary Least Square (OLS) estimators revealed best factors influencing fish feed supplies by Feed Millers and Wholesalers with Linear functional form and for Retailers with Exponential functional form (Table 4).

Fish Feed Millers: Table 4.0 shows that for the Feed Millers, the price of Maize and other resource prices had inverse influence in the

supply of fish feed. This was in line with a priori expectations that increases in price(s) of inputs/resources used in manufacturing lead to increases in the cost of production which lower the profit margin of the manufacturers and functioned as a disincentive to the quantities of fish feed supplied by the feed millers in Ikeja. This finding was in line with the findings of [6] and [17] in production of poultry products in Nigeria and Ghana respectively.

The coefficient of price of related product (price of pelleted poultry feed) was negative (-0.393) and highly significant ($p<0.01$), suggesting that a unit increase in the price of pelleted poultry feed reduces supply of fish feeds by 0.393%. This was plausible because when price of poultry feed increase, feed millers produced and supplied more of poultry feeds, - the close substitute. The production of more poultry feed consumes more of raw materials especially maize which the fish feed production competes for and therefore forced down production of fish feed as well as its supply by the millers. The increase in unit price of fish feed was directly proportional and highly influential ($p<0.01$) in determining the its increased quantity supplied. The cost of transportation had a positive but lower influence ($p<0.10$) on the quantity of the feeds supplied in the area. In an opposite (negative), taxes/levies on the millers had lower influence ($p<0.10$) on the quantity of fish feeds supplied. Access to credit was a factor that had positive and high influence ($p<0.01$) on the quantity of fish feeds supplied in the area.

Feed wholesalers: The lead equation revealed that price of the fish feed, transportation cost, and the traders access to credit were factors that positively and highly influenced supply of fish feed by the wholesalers. This revelation confirms the findings of [2] that availability of credit significantly impacts on production decisions of poultry farmers that enabled them expand their production scale and their product supply. The storage cost of the fish feeds had negative and high influence ($p<0.01$) on the supply of feeds by the wholesalers trading on it in the area.

Feed Retailers: The Price of related product (Pelleted Poultry Feed), taxes and levies had negative and moderate influences ($p<0.05$) on quantity of fish feed supplied by retailers in the area.

Table 4. OLS Lead Equations Estimate of Factors that Influenced Fish Feed Supplies By Stakeholders (Feed Millers, Wholesalers, and Retailers) in Ikeja, Nigeria

Variablrs	**Feed Millers (n=21)**	**Wholesalers (n=21)**	**Retailers (n=63)**
	Lead Functional forms		
	Linear	**Linear**	**Exponential**
Constant	4.498***	411.492***	41.674
	(3.213)	(3.892)	(0.735)
Maize/Resource Price	-0.327***	N.A	N.A
	(-3.147)		
Price of related product(Pelleted Poultry Feed)	-0.393***	-0.736	-0.261**
	(-2.727)	(1.552)	(-1.985)
Price of Fish Feed	0.464***	0.927***	1.561***
	(4.108)	(3.616)	(3.341)
Level of Education	N.A	2.932	0.224
		(1.322)	(0.910)
Marketing Experience	N.A	0.089	0.323*
		(1.214)	(1.713)
Transportation cost	0.361*	0.147***	0.674
	(1.726)	(3.689)	(1.037)
Taxes/Levies	-0.438*	1.14e-06	-1.062**
	(-1.698)	(1.542)	(1.964)
National/Religious festival Months	0.043	N.A	N.A
	(1.062)		
Production Technology	0.043	N.A	N,A
	(1.350)		
Storage Cost	N.A	-1.275***	-0.425
		(-3.727)	(-0.624)
Credit Access	0.460***	0.274***	0.310**
	(3.456)	(3.614)	(2,204)
R-Square	0.703	0.6705	0.7151
Adjusted R-Square	0.683	0.6325	0.6921
F-Value	42.730***	9.756***	17.564***

Source: Own calculations, 2019.

***, **, and *, indicate variables significant at 1.0%, 5.0%, and 10.0% alpha levels of probabilities respectively.

Figures in parentheses are t-ratios.

Another factor (Access to credit), had a moderate and positive influence on the quantity of fish feed supplied by the retailers in the area.

The only factor that highly and positively influenced ($p<0.01$) the supply of the fish feed by retailers in the area was price of the product- the fish feed.

To enhance supplies of fish feed and other livestock feeds in Ikeja, there is need to

reduce taxes, rents on sales stalls and warehouses, and prices of maize the major raw materials livestock production as well as encourage sources of loans to easily lend millers and traders.

CONCLUSIONS

This study concluded as follows:
(i)Branded and unbranded fish feeds are sold by wholesalers and retailers in Ikeja feed markets;
(ii)Fish feed marketing was profitable to both wholesalers and retailers in Ikeja, Nigeria;
(iii)Bulk transportation of raw materials, feeds and humans were done at high prices in the area;
(iv)The wholesalers and retailers exploited the fish farmers as both posted marketing efficiencies of far above 100.00% in the area;
(v)High marketing efficiencies suggested relatively high prices being charged on the fish feeds sold in Ikeja.
(vi)Landlords of stalls and warehouses in the area are charging highly for the use of their facilities in the area.
To encourage fish feed marketing in Ikeja we recommended as follows:
(i)Both wholesale and retail trade on fish feeds should have easy access to trade loans. Commercial Banks, and Bank of Agriculture should extend easy loans to these traders to enhance their trade;
(ii)Lagos State government should focus and bring down transport costs and make fish feed traders enjoy cheap transport for their wares. Transportation costs can be reduced by subsidizing cost of fuel, providing cheap input delivery vans, and repairing damaged roads;
(iii)Landlords should charge moderate prices for the use of their facilities as stalls and warehouses in the area. Buildings that are relatively old in service in the area should charge relatively lower rents in the area to provide cheap accommodation as sales stores and warehouses.

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