

# Assessment of Fish Feeds Used in Fish Farms in Ado-Ekiti, Nigeria and Effects on Fish Production.

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## Abstract

The study was aimed at assessing the feeds used in fish farms in Ado-Ekiti and its effects on fish production. Data were collected from thirty fish farms through administration of questionnaires. The result of the analysis showed that 33.3% of the respondents feed their fish with both imported and local pelleted feeds, 26.7% feed their fish with local pelleted feeds only, 20% feed their fish with imported feeds only, 16.7% feed their fish with other Nigerian feeds, while 3.3% feed their fish with locally formulated powdered feeds. On level of fish production, 40% fish farmers produced 1500kg of fish per annum, 16.7% produced 2000kg of fish per annum, 13.3% produced 500kg per annum, 10% produced 1200kg per annum, 6.7% produced 1300kg per annum, and another 6.7% produced 1000kg per annum, while 3.3% produced 200kg per annum. Low level of production for some may be due to the farmer's inability to create time and manage fish farm as a worthwhile business and the farmer's inability to improve on feeding practices. Concerted efforts should be made on fish feed production techniques to increase production and meet the demand for fish feed need by farmers.

**Key words:** Fish Feeds, Ado-Ekiti, Fish Production.

## 1. Introduction

Good nutrition in animal production system is essential to produce a healthy, high quality product. Feeding cost represents the largest single cost item of most fish farm operations, accounting for about 60% of the total cost of fish production according to some research (Jamu and Ayinla, 2003). Fish nutrition has advanced dramatically in recent years with the development of new balanced commercial diets that promote optimal fish growth and health. The development of new species' specific diet formulations support the aquaculture (fish farming) industry as it expands to satisfy increasing demand for affordable, safe, high quality fish and seafood production (Craig and Helfrich, 2002).

Fish have a certain biological requirement for nutrients in order to have a healthy, vigorous growth and this nutritional requirements vary mainly depending on the species, its size / life stage and the environment (Robb and Crampton, 2013). Among non-conventional feed stuff incorporated into feeds are cocoa husk (Adebowale and Olubamiwa, 2008), sunflower and sesame seed meal (Fagbenro *et al.*, 2010) and plantain peels (Agbabiaka *et al.*, 2013).

Prepared or artificial diets may be either complete or supplemental. Complete diets supply all the ingredients (protein, carbohydrates, fats, vitamins and minerals) necessary for the optimal growth and health of the fish. When fish are reared in high density indoor systems or confined in cages and cannot forage freely on natural feeds they must be provided a complete, high quality nutritious diet in order to grow rapidly and remain healthy. In contrast, supplemental (in-complete, partial) diets are intended only to help support the natural food (insects, algae, small fish) normally available to fish in ponds or outdoor raceways (Craig and Helfrich, 2002).

The composition (fat, moisture, protein etc.) of the fish feed influences the physical and organoleptic properties of the final product (Spinelli, 1980). However, there are several limitations that hinder adequate supply of feed ingredients used in fish feed production. The most crucial problem associated with feed ingredients is the cost of acquiring them and scarcity. While some other problems may be lack of technical know-how in combining or mixing the nutrient requirements for each species of fish and inadequate space for feed processing. Feeding plays a major role in determining the success of any fish venture, therefore it is imperative that a survey of feeds used in fish farms in Ado-Ekiti be carried out. One, to have a reliable data on this important aspect of fish farming and two, to be able to advise the farmer appropriately on the type, quantity and quality of the feed to be used to bring about a good profitable fish farming business as a major goal in any business is to make profit. Fish is a profitable business but unless important aspect of it, feeding being a major one, is addressed, the result may not be encouraging.

## 2. Methodology

### 2.1 Study Area

The study was carried out in Ado-Ekiti, the capital city of Ekiti State, South Western Nigeria. Ekiti State was created on October 1<sup>st</sup> 1996 out of the old Ondo State. The town lies on latitude  $7^{\circ}49'$  North of the equator and longitude  $5^{\circ}27'$  East of the Greenwich Meridian about 250 metres above sea level. The people in Ado-Ekiti are mainly of Yoruba ethnic group.

Ekiti State is endowed with different water resources. Some of its major dams are Ero, Egbe and Ureje dams, while major rivers include Ogbese, Ose and Oni Rivers, the fishing communities in the State include: Ikun Ekiti in Moba Local Government Area, where Ero dam is located, also Ogbese Ekiti in Ise/Orun Local Government Area of the State.

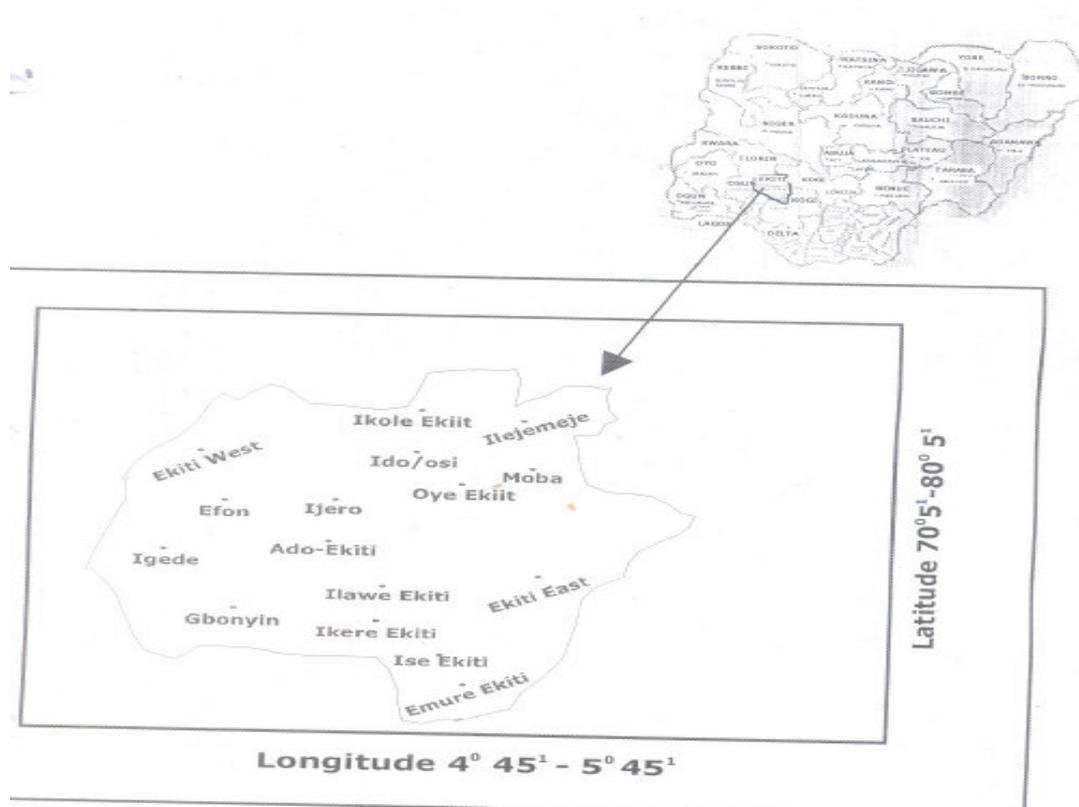


Figure 1: Map of Ekiti State showing the Study area.

### 2.2 Data Sources and Collection

The survey was limited to fish farms in Ado-Ekiti. The method used was by the administration of questionnaires to fish farms and feed mill owners. Personal visits were made to each farm and mill for the purpose of collecting accurate data for the study. Deductive method was used to get the data from the farmers through personal interview with them. Some of these farmers did not understand words like stocking density, monoculture/polyculture, therefore explanations were given to them on these words which made it possible to get the data required. The questionnaire requested information on the size of the farms, management systems used, types of feeds used, level of feeding, major problems or constraints to fish feed production, level of annual fish production etc. 35 questionnaire were distributed, out of which 30 copies were retrieved for processing.

Various types of feed were being used by these farms with varying degrees of success. It was observed that some fish farmers do not take into cognizance the aspect of feeding or do not plan for it from the onset and end up not

feeding the fish at all or feeding insufficiently, at times not meeting the nutrients' requirements of the fish. This of course affects the output of the farm.

### 2.3 Method of Analysis

The results were interpreted using frequency and percentage tables, these were used to explain the production per annum, problems associated with feed and feeding practices in these farms, and to determine the types of feeds and feed ingredients used in fish farms.

Table 1: Fish Farms in the study area and their current situation.

	<b>Names of Fish Farms</b>	<b>Types of Enclosures used</b>	<b>Current situation</b>
1.	Babajide Farm	Earthen ponds	Functional
2.	D-drive Farm	Plastic tanks	Functional
3.	Mayowa Fish Farm	Earthen ponds	Functional
4.	Afolabi Fish Farm	Earthen ponds	Functional
5.	Able Farm	Earthen ponds	Functional
6.	A.O. Akinro Farm	Earthen ponds	Functional
7.	Olaiya Farm	Earthen ponds	Functional
8.	Bimbola Venture	Concrete ponds	Functional
9.	Daramola Farm	Earthen ponds	Functional
10.	Emmanuel Farm	Concrete ponds	Functional
11.	Akinyelu Farm	Earthen ponds	Functional
12.	Adetile Farm	Earthen ponds	Functional
13.	Matthew Ojo Farm	Earthen ponds	Functional
14.	Fedak Farm	Concrete/Earthen ponds	Functional
15.	Resurrection Farm	Concrete ponds	Functional
16.	Olad's Fish Farm	Earthen ponds	Functional
17.	Ojo S.I. Fish Farm	Concrete Ponds	Functional
18.	Abegunde Farm	Earthen ponds	Functional
19.	Mrs. Oluranti Farm	Earthen ponds	Functional
20.	Azeez Farm	Concrete ponds	Functional
21.	Iyabo Farm	Concrete ponds	Functional
22.	Joy Farm	Concrete ponds	Functional
23.	FM Farm	Concrete ponds	Functional
24.	Ogunleye Farm	Concrete ponds	Functional
25.	Temitope Farm	Earthen ponds	Functional
26.	Abbey's Farm	Concrete ponds	Functional
27.	Hope Fish Farm	Concrete ponds	Functional
28.	Tolu Pakad Farm and Feedmill	Earthen ponds	Functional
29.	Metrovet Consultancy: farm & feedmill	Concrete ponds	Functional
30.	Amen Fish Farm	Concrete ponds	Functional

Source: Field Survey, 2012

## 3. Results

### 3.1 Types of Feeds Used in Fish Farms in Ado-Ekiti

The result of feeds used in the fish farms in Ado-Ekiti is presented in Table 2. From the table, it can be seen that 33.3% of the respondents feed their fish with both imported and local pelleted feeds, 26.7% feed their fish with local pelleted feeds only, 20% feed their fish with imported feeds only, 16.7% feed their fish with other Nigerian feeds, while 3.3% feed their fish with locally formulated powdered feeds.

Table 2: Feeds used in Farms in Ado-Ekiti

Types of feed	Frequency	Percentage
Imported feeds	6	20.0
Local pelleted feeds	8	26.7
Other Nigerian feeds	5	16.7
Powdered feeds	1	3.3
Imported and local pelleted feeds	10	33.3

### 3.2 Level of Patronage of Feeds Sold

The result of the survey shows that 66.7% feed marketers had good patronage while 33.3% did not indicate the level of patronage. This is presented in Table 3.

Table 3: Level of Patronage of Feeds sold

Level of patronage	Frequency	Percentage
Very good	-----	-----
Good	20	66.7
Fair	----	----
Poor	----	----
Not indicated	10	33.3

### 3.3 Level of Fish Production

Table 4 shows the production of fish farmers in Ado-Ekiti per annum. The study showed that 3.3% produced 100kg per annum, 3.3% produced 200kg per annum, 13.3% produced 500kg per annum, 6.7% produced 1000kg per annum, 10% produced 1200kg per annum, 6.7% produced 1300kg per annum, 40% produced 1500kg per annum, while 16.7% produced 2000kg per annum.

Table 4: Level of Fish Production

Levels of Production (kg)	Frequency	Percentage
100	1	3.3
200	1	3.3
500	4	13.3
1000	2	6.7
1200	3	10
1300	2	6.7
1500	12	40
2000	5	16.7

### 3.4 Problems Militating Against Adequate Feeding of Fish

From the survey it can be seen that the major problem that militate against adequate feeding of fish is high cost of feeds and feed ingredients, constituting 46.7%; while lack of acceptance of feed is 26.7%; lack of technical know – how: 16.7% and inaccessibility of feed is 10%. This is shown in Table 5.

Table 5: Problems militating against adequate feeding of fish

Problems	Frequency	Percentage
Lack of technical know – how	5	16.7
Inaccessibility of feeds	3	10
High costs of feeds and feed ingredients	14	46.7
Lack of acceptance of feed by fish	8	26.7

### 3.5 Problems Associated with Fish Feed Production

The outcome of the study indicate that cost of feed ingredients is mainly the problem associated with feed production constituting 53.3% while that of lack of trained personnel is 26.7%, 13.3% for lack of ingredients, and 6.7% for lack of acceptance of feeds. This is presented in Table 6.

Table 6: Problems associated with fish feed production

Problems	Frequency	Percentage
Lack of feed ingredients	4	13.3
Cost of feed ingredients	16	53.3
Lack of acceptance of feeds	2	6.7
Lack of trained personnel	8	26.7

## 4. Discussion

The study was carried out to determine the types of feeds used in fish farms in Ado-Ekiti and effects on fish production. Also to identify major problems associated with feeding and feed production. The study has brought to light how the different feeds used and management practices in these farms have effects on their production. According to the study, the yield recorded in each fish farms varied, ranging from 100-2000kg, this could be due to the type and quantity of feeds given to the fish, Craig and Helfrish (2002) observed that good nutrition in animal production system is essential to produce a healthy, high quality product.

According to the study, majority of the fish farmers feed their fish with local pelleted feeds (26.7%). This may be due to the fact that it is not that expensive and it can be formulated easily to meet the nutrient requirement of fish. This is in agreement with the work of Rana and Hasan (2013) who reported that when farmers used locally made feeds, feed cost always tend to drop by 10-20% irrespective of intensity of stocking or species stocked. 3.3% produced their feed in powder form and moisten it when feeding it to the fish, this type of feeding practice could lead to waste of majority of the feed as it easily dissolve when it enters water and becomes unavailable to the fish unlike if it was in pellet or floating form, 33.3% feed with imported feeds between 0-2months and complete the rearing period with locally formulated pelleted feeds afterwards. This could be due to the high cost of imported feeds as compared with locally formulated feeds. Although 20% recorded that they used imported feed all through, a higher percentage (26.7% and 33.3%) reported using only (26.7%) or mostly (33.3%) locally formulated feeds, which is done by switching from imported feed to locally formulated feeds after about two months of stocking with fingerlings. This is a common practice of many fish farmers who believe that the imported feeds are high quality fish meal feeds with a complete nutritional profile for meeting the nutritional requirement of fish (Hardy and Tacon, 2002), and that it will give the specially young and vulnerable fingerlings a healthy start.

Level of patronage of sales by the feed mills was recorded as very good and majority of people within the State patronized them in their shops where the feeds are sold, this goes to show that the level of awareness of using complete diets as is the case for most imported and local pelleted feeds sold by these feed mills is increasing as against some years back when fish farmers felt that crumbs or kitchen wastes were enough to sustain fish or that fish could fend for themselves, quoting a popular saying that "nobody fends for the fish in the seas".

Also, the study revealed that the major problem militating against adequate feeding of fish is high cost of feed and ingredients constituting 46.7%, this may be due to lack of capital in procuring the feeds and the feed ingredients. 26.7% constitute lack of acceptance of feed by fish; this may be because the fish are not fed their preferred feed. This is similar with the work of Ayinla (1988) who observed that nutrients requirements and feed preference vary with rearing environment, water temperature and water quality.

It was observed that just two fish feed mills were in operation in Ado-Ekiti. If this is so for the State capital, there is the likelihood that feed mills do not exist in other parts of the State especially the remote areas. This definitely will reduce accessibility to pelleted feeds and may also discourage farmers from formulating balanced diets because even if they are balanced, if fed to fish in moist- powdered form, much of the nutrients will be lost.

The study revealed that the major problem associated with fish production is cost of feed ingredient constituting 53.3%. This agrees with the work of Jamu and Ayinla (2003) who reported that feed constitute about 60% of production cost. This was followed by the lack of trained personnel constituting 26.7%.

## 5. Conclusion

This study shows that fish farming has great potentials and is one of the easiest ways of meeting the demand for fish in the country. In any aquacultural establishment, proper management and feeding is very important as this is a major determining factor of the output. Much success cannot be achieved unless managerial problems associated with fish feeds are adequately combated, such problems as high cost of feed ingredients, lack of capital and lack of technical know-how as to how to combine the feed ingredients. If the problems associated with management are eliminated, fish farms in Ado-Ekiti will contribute a greater percentage to fish demands in Nigeria.

### 5.1 Recommendation

It is recommended that more awareness about proper feeding practices and feeding to meet the nutrient requirements of fish should be created in the rural and urban areas of the State, and that government agencies like the Agricultural Development Programme (ADP), Ministry of Agriculture and Development, Fisheries Division and extension agents should be more involved in creating awareness.

Awareness should be created too on importance of feeding, as many prospective fish farmers start the business when informed about the profit they could make, rush into the business and stock large quantities of fish but then to feed becomes a problem and on the long run, they get poor results because they did not plan for feeding ahead of time.

Another major area of awareness needed is the use of locally available feed ingredients that could be used to formulate good nutritionally balanced diets instead of using expensive imported feeds.

It is also recommended that more feed mills be established by private individuals and government in the State. Prospective fish farmers are advised to consult fisheries experts rather than quacks when starting their business. Concerted efforts should be made on fish feed production techniques to increase production and meet the demand for fish feed need by farmers.

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