ECONOMICS OF SWINE PRODUCTION AND MARKETING IN ZANGO KATAF LOCAL GOVERNMENT AREA OF KADUNA STATE, NIGERIA

BY

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A Thesis submitted to the Postgraduate School, Ahmadu Bello University, Zaria in partial fulfillment of the requirements for the Degree of Master of Science (M.SC), In Agricultural Economics, Department of Agricultural Economics and Rural Sociology, Faculty of Agriculture, Ahmadu Bello University, Zaria

NOVEMBER, 1998

DEDICATION

To my wife Mrs. MERCY ANNA BANTA for her support during the course of studies.

DECLARATION

I hereby declare that this thesis is written by me and it is a record of my own research work. It has not been presented in any previous application for a higher degree.

BANTA AYUBA LA'AH — DATE: 3/2/1999

The above declaration is confirmed

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CERTIFICATION

This thesis entitled "Economics of Swine Production and Marketing in Zango Kataf Local Government Area of Kaduna State, Nigeria" meets the regulation governing the award of Degree of Master of Science of Ahmadu Bello University, Zaria and is approved for its contribution to scientific knowledge and literary presentation.

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ACKNOWLEDGEMENTS

The practical problems which confronted me directly or indirectly during the course of this study could not have been solved without the assistance of other persons.

First, I am sincerely grateful to my supervisors, Prof. J.O. Olukosi and Dr. D.O.A Philip who despite their tight schedules made this research work a reality. I am heavily indebted to Mr and Mrs. Bala D. Madaki and Mr & Mrs Dauji Laahki for their material support during the course of this study. I am equally grateful to my friends, Lyock S.W., Adrew C. Iheanacho, Likita Gallah, Dr. Peter Katu; Duniya and a host of others too many to mention here, for their moral support and encouragement at times of low "spirit". I acknowledge the patience and encouragement of my wife Mercy Anna Banta, and children Naphatali Banta (Son), Grace Banta (daughter) Jemimah Banta (Daughter) for managing the affairs of the family during the period of the studies.

Finally, I am grateful to the Almighty God for his love and protection over me and the entire members of my family.

ABSTRACT

This study was designed to evaluate the "Economics of Swine Production and Marketing in Zango Kataf Local Government Area of Kaduna State, Nigeria". The objectives of the study include (i) to determine the costs and returns of pig production in the study area; (ii) to determine the structure and conduct of the pig market, (iii) to determine the marketing margins and efficiency of pig marketing and (iv) to identify the problems of pig production and marketing in the study area and suggest control measures. To achieve the objectives, data were collected from 90 pig farmers and 30 marketers in the study area during the month of May and August 1997. The analytical methods chosen for the study were descriptive statistics, farm budget model, Gini coefficient and marketing performance measuring techniques such as marketing margin and efficiency.

The result showed that majority of the farmers were making profit sufficient to cover their expenses, as shown in the findings of the net farm income (means).

The empirical results of the marketing structures measured by Gini coeficient of 0.51 for wholesalers and 0.50 for retailers indicated that there are some moderate degree of concentration in the market.

The producer's share of what the final consumer paid was 78.25%. The average marketing margin was 22%. The result of marketing efficiency analysis indicated that Katsit market was more efficient than Zonkwa and Samaru Kataf. Based on the margins and

efficiency ratio analysis, the pig marketing is both efficient and profitable.

Problems identified amoungst pig producers include high cost of feeds, cost of drugs and veterinary services, poor housing, lack of finance, poor road system, lack of improved breeds and low prices of pigs. Problems associated with pig marketing were identified to include lack of shades, lack of modern abbatoirs, mistrust lack of financial capital and price fluctuations.

The following recommended measures are suggested in order to control the situation:

1. The State Ministry of Agriculture and its agencies should revive the breeding of improved more prolific breeds to increase production.
2. Both farmers and marketers need to be assisted financially and the state government is called upon to create an agency that will give funds to both farmers and marketers.
3. Shade and storage facilities such as cold stores should be provided in each of the markets so as to improve the condition under which people buy and sell pigs.
4. The State Government should purchase, install and monitor weighing scales so that pricing particularly at the market sites should be reorganised to the use of standard measurement.
5. The improved feeds including concentrates should be made available to farmers at affordable prices.

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CHAPTER 1

INTRODUCTION

Pig (Sus scrofa), is one of the sources of animal protein in Nigeria. The production which is both in the hands of government institutions and private individuals represents the fastest way of increasing the animal protein since they grow at a faster rate and reproduce sooner with large number of offsprings than cattle, sheep or goats.

The swine industry in Nigeria has not yet developed like the ruminants and poultry industries because pigs are not generally used for meat purposes by majority of the population (Adebosin and Malgwi, 1986). This is based on culture and religion which make it a taboo for pigs to be eaten by some people.

Pig is traditionally a scavenger, having been raised as a means of utilizing human food wastes in early domestication. However, current production involves the use of foodstuff or waste product of human food as feeds. The production in Nigeria is relatively less compared to other classes of livestock. Nigeria has the second highest population of pig in Africa. It accounts for 4.5% of the total meat supply of the country (Adebambo, 1982).

Traditionally, the indigenous pigs found in many villages are reared in extensive range system where they are allowed to roam and scavenge and graze at will. The

swine industry constitutes about 4.0% of the livestock industry in Nigeria based on the report of Nigeria Livestock Resources (1992). The current distribution of the livestock is as shown in Table 1.1

The figures which indicate the population of livestock in both villages and urban areas also show that the population of the pigs just like other classes of livestock is more in villages than in the urban centres.

In Kaduna state, most pig farmers practice semi-intensive system of management due to scarcity of feeds, while very few farmers who can afford feed procurement practice intensive system. Rekwot et al (1990) established that in the rainy season when all available land is heavily cropped, the pigs are confined and fed, intensively. In the dry season the reverse is the case when the pigs are allowed to scavenge freely and still given some supplementary feeds. In the study area 98% of the pigs are reported raised on small family farms while the rest are in institutional or large intensive production units (Pathiraja et al (1986).

The types of production include breeding and fattening, breeding alone and fattening alone. Rekwot et al (1990), reported that breeding and fattening group accounted for 40% of the pig owners, 10% keep breeders alone and 50% keep growers/fatteners.

Table 1.1: Livestock Population in Nigeria

Species	Pastoral	Village	Urban	Total
All Cattle	11,478,145	2,358,078	44,590	13,880,813
Goats	1,142,154	32,287,589	1,023,981	34,554,724
Sheep	2,678,157	18,356,718	1,051,732	22,092,602
Donkeys	6,872	920,828	9,132	936,832
Horses	3,396	194,706	8,110	206,212
Camels	11,050	76,241	548	87,839
Pigs	-	3,352,560	53,821	3,406,381
Dogs	-	1,475,437	244,409	1,719,846
Guinea rats	-	60,848	3,585	64,833
Guinea pigs	-	388,824	85,284	474,108
Cats	-	3,092,378	3,092,378	173,409
All poultry	-	97,860,320	6,397,640	104,257,96
Chicken	-	68,244,195	4,156,661	72,400,356
Ducks	-	11,220,461	573,507	11,793,986
Guinea fowls	-	4,621,670	58,237	4,679,907
Pigeons	-	13,566,775	1,593,091	15,159,88
Turkey	-	207,219	16,144	223,363

Source: Nigerian Livestock Resources Survey (1992). Federal Department of Livestock and Pest Control Services Inventory and Management Limited

1.1 History of Pig Industry in Nigeria

Swine production has undergone gradual growth over the past years. The expansion of the industry has been possible due to improvement in breeding stock, veterinary services and feedstuff. Loosli et al (1974) recorded that improved breeds of pigs were kept only at government stations in 1963. All feed production and marketing of pork was handled by government units. By 1972 there were more than 2,000 private pig farms and balanced feed were available commercially. Both government and private exterpreneurs now process and distribute pork products but more pork is needed to meet the demand.

Although a large number of the livestock are slaughtered in the rural areas unregistered, the figures in Table 1.2 show there is increase in production, and on the other hand the demand for their meat, by the nation's population.

Table 1.2: Number of Livestock Reported and Slaughtered by States 1989/1990

	Sheep		Pig		Camel	
State	1989	1990	1989	1990	1989	1990
Abuja	2,778	23208	315	502	-	-
Akwa-Ibom	16,716	11220	26,800	1,048	-	-
Anambra	72,622	63,093	15,323	14,655	-	-
Bauchi	444,620	472,637	2,232	3,124	30	60
Bendel	3,627	4,856	16,659	20,583	-	-
Benue	188,394	118,042	132,053	182,142	-	-
Borno	165,979	165,827	-	-	17,986	19,891
Cross-River	2,654	2,586	5,802	6,380	274	-
Gongola	34,839	35,216	6,632	2,108	5	25
Imo	3,675	4,660	100	534	-	-
Kaduna	35,520	35,659	9,375	10,342	1,328	1,438
Kano	274,515	275,461	-	-	30,439	30,350
Katsina	-	-	-	-	-	-
Kwara	5200	6,550	3,592	6,036	-	-
Lagos	13,839	15402	1,189	1,397	448	492
Niger	17,339	24384	56	565	-	-
Ogun	11,166	11,409	841	195	-	-
Ondo	80	884	782	11,210	-	-
Oyo	15,8322	16,084	10,666	14,141	10	26
Plateau	47,388	52,126	14265	15,691	338	371
Rivers	507	3,357	278	1,236	-	-
Sokoto	4122	15,188	-	-	-	-
Total	1,279,990	1,357849	247,260	297614	52,591	56,713
Kaduna State as % of Total	2.77	2.62	3.79	3.47	2.50	2.58

Source: Annual Abstract of Statistics (1991).

Shaw and Colville (1950), reported that pigs were being farmed very successfully by the Agricultural Department at Shika, Samaru and Veterinary Department in Vom. Balogun (1981) pointed out that organised commercial pigeries have been reported in Kano, Niger,

Benue and southern states such as Oyo, Ogun, Lagos and Rivers. He also stated that domestic production is in the increase. Pigs slaughtered in public abattoirs are usually those reared under extensive system of Management. They account for 75-85% of the pork consumed in the country.

Interest shown by the Federal Government in the pig industry was its participation in the commercial sector through the Nigeria Livestock and Meat Authority through acquisition of both Kano and Minna Pigeries which later collapsed. Other contribution of the government include direct funding of swine research programme by Federal Universities and other institutions aimed at increasing production of pigs in the country. Also, development activities at the state level geared towards production programme are assisted by the Federal Government.

1.2 Problem Statement

The problem of initial capital is one that has plagued potential livestock farmers for many years, (Balogun, 1981). The typical Nigerian pig farmer has only two to three sow units which are kept under extensive condition in his backyard or small subsistence condition because he cannot afford the initial cost of large operation.

A prominent problem which has long time hampered pig production in Nigeria especially in the North is the question of pork being a taboo for muslims who form a major part of the population (Balogun, 1981; and Mathewman, 1977). Consequently, pig producers in such areas are usually discouraged due to lack of market and lack of regard for them.

Pig production is predominantly semi-intensive, (Rekwot et al, 1990). The pigs are allowed to move about uncontrolled during the dry season resulting in losses due to motor accidents, poisoning, theft and disease infection. This situation increases the cost of production for farmers thereby adversely affecting expected profit of the production.

The quality of feed is substandard resulting in the pigs taking longer time to attain market weight. Jerome (1973) pointed out that the pigs reach 60kg at 12-18 months. Olomu and Oboh (1995) established that market pigs should be fed grower diet from 20kg to 60kg (10 to 12 weeks) and then a fattener diet from 60kg to 105kg. It is observed that this condition is not achieved by the rural farmers since the pigs are fed with low quality feeds which are not of commercial production to supplement their scavenging feeding.

The pig market is observed to be made up of speculative middlemen who buy the pigs with the aim of

selling them at the times when prices have risen. They also buy and sell in different areas when there are differences in prices over times. However, one of the major problems in pig marketing is that while production takes place in the study area consumption is more in the southern states of the country. In most of the market days, buyers arrive in the markets from the south to purchase and transport pigs in lorries and pick-up vehicles to various southern cities. On market days that they fail to turn up, low prices result due to fallen demand.

Another problem of marketing of pigs is poor transportation system. The rural feeder roads are so poor that during the rainy season some farmers find it difficult to convey their products to the markets. The marketing arrangements also have shortages of facilities such as weighing scales, which result in prices being fixed by considering the physical outlook of pigs rather than by weight. Retailers like the butchers, lack storage facilities such as cold stores, refrigerators etc and consequently leading to losses due to spoilage.

These marketing problems highlighted affect both the marketing margins and the willingness to produce under a situation of price instability for instance, the producer and the marketer cannot operate efficiently. Since literature on swine production and marketing in the state

are scarce, despite the fact that most farmers keep pigs this study would bridge the information gap on pig production and marketing. Specific questions which this research will address include:

i. Is pig production and marketing profitable in the study area?
ii. How efficient is the marketing of pig?
iii. What are the problems associated with pig production and marketing?

1.3 Justification for Study

The Kafanchan (Katsit) pig market which is situated in Zango Kataf Local Government Area is reported to be attracting both sellers and buyers of pigs all over Nigeria. With increasing production in pigs, both farmers, middlemen and Government gain from the market. For instance the revenue collected from the Kafanchan pig market in 1991 was ₦47439.00 and in 1995 ₦85,344.00. This goes to an extent in pointing to the fact that pigs contribute to the development of internal economy through revenue generation.

The value of pig production in Nigeria should be assessed from its potential contribution to the National Livestock Economic Development. Pig has the following advantage over other animals (Adekunle, 1995).

1. Pigs have short generation interval and prolific fecundity
2. Pigs have 15,000 taste buds as against 8,000 in humans which allow them to eat every edible thing including forage
3. It is also more efficient carcass yielder than cattle, sheep and goats. Its dressing percentage is about 65%-75% compared to between 50-55% for cattle and 48-55% for sheep and goats (Balogun 1981).
4. The carcasses are easier to dress and have superior curing qualities needed for processing and marketing
5. Pigs adapt readily to most environmental conditions
6. Pigs faeces make good fertilizers for crops
7. Pigs excel other red meat animals, such as cattle, sheep and goats in converting feed to flesh.

Expansion of pig industry should go along with improvement in marketing and distribution. There appears to be over-production of pigs in certain parts of the country whereas there is acute shortage of pork in other parts as reported by Okorie (1978).

Marketing is vital in ensuring that agricultural products reach consumers in good condition and are presented in a convenient way. Production itself must adapt to market requirements.

For this reason, research on pig production and marketing is necessary. Thus, the basis for the choice of the topic. Infact, the lives of many people in the study area and other parts of the country depend on pigs either directly or indirectly. Improvement in pig production and marketing system can produce a multiplier effect leading to improvement in the living standards of the farmers. It is in appreciation of this potential of pig industry that this research work is undertaken.

1.4 Objectives of Study

The broad objective of this study is to evaluate the economics of pig production and marketing in Zango Kataf Local Government Area.

The specific objectives are:

i. to determine the costs and returns of pig production in the study area;

ii. to determine the structure and conduct of the pig market;

iii. to determine the marketing margins and efficiency of pig marketing and

iv. to identify the problems of pig production and to suggest control measures.

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1.5 Organisation of the Study

This write-up has been organised into five chapters. The first chapter is the introductory aspect of the study, chapter two contains review of the literatures that are related to the of this work. Chapter three contains the methodology. Chapter four contains the analysis of the data and discussion of the results while chapter five contains the summary of the study, conclusion and recommendations.

CHAPTER 2

LITERATURE REVIEW

2.1 Potential for Swine Production

Swine production has great potentials in Nigeria. Some of the reasons are examined in the following section.

2.1.1 Land availability

According to Balogun (1981), it has been estimated that Nigeria has a total available agricultural land area of approximately 92,377,000 hectares out of which 21,795,000 ha. are under permanent crops. Nigeria is therefore blessed with tremendous potential for agricultural development. Compared to the ruminant animals that require sizeable grazing land, pigs require much less land.

Also, unlike the ruminants that require the establishment of vast areas of sown pastures on medium to very good soils, pig production under intensive management can be raised on soil considered unsuitable for carrying high yielding grazing pastures. In terms of land availability therefore, Nigeria has a higher potential in pig production than for any of the red meat animals.

KASU

2.1.2 Availability of feeds

It is generally accepted that pigs compete with main for food (Rekwot, et al, 1990). While this is potentially true, it is noteworthy that the variety of feedstuffs consumed by pigs are either unsuitable for man or unacceptable to him. More and more of our agricultural products are being processed locally with the result that large quantities of by-products unsuitable for known consumption are available and should be explored for pig feeding. These include by-products from brewing, flour millings, oil seed extractions, livestock and fish processing and root crop processing industries. Pigs are the group of animals that can best utilise these by-products and convert them to quality meat (Jerome, 1973).

2.1.3 Foundation stock

The native pig is characterized by slow growth and poor feed conversion efficiency (Fetuga et al, 1976; Pathiraja, 1987; Cheng 1983; Standal, 1978). They also reported that the indigenous pig produced fatter carcasses than the imported European pig. Most of the breeding stock is native and had little or no influence of outside improved breeds. A sow could produce 8-10 piglets at farrowing, but only 3-5 may reach weaning age (Okorie, 1978). Therefore to reduce the cost per pig at

weaning time, the sow must have large litters of healthy piglets, and also be good mothers so that they will raise nearly all that they farrowed. The exotic breeds raised in Nigeria today include large white, landrace, Duroc and Hampshire (Pathiraja et al, 1986).

2.1.4 Management skill

Successful pig production involve good management and disease control in humid tropical environment such as Nigeria (Hietman and Hudges, 1949). The regular training workshop in the states by the staff of the National Agricultural Extension and Research Liaison Service (NAERLS) offer considerable opportunity to pig farmers to avail themselves of improved technology and upgrade their management skill (Balogun, 1981).

2.2 Pig Management System

The management of pig which constitute an important aspect of the industry is considered below.

2.2.1 Production

Pathiraja et al (1996) reported that production system in southern Zaria is described as small scale, semi-intensive and semi commercial. The extensive production systems described as small subsistence production are common among village level production

units where the genotypes used are mostly indigenous and are run free range for most of the year (Alba, 1972; Falvey, 1979; Pathiraja, 1987).

In semi-intensive systems pigs are usually confined either in pens or in large areas and are fed largely or in low quality bulky diets such as root and leaf vegetable and all kinds of household food residues, and small proportions of supplement concentrates. Medium and large size intensive production units are mostly found in the urban areas and seen in high proportions in the countries where pig production is highly accepted (Nestle and Castillo, 1985).

2.2.2 Housing

Pigs need to be protected from extreme weather conditions such as too much heat or cold (Andrews et al, 1960). Many systems of housing are in use but whichever system is adapted the house must be well ventilated. Rekwot et al, (1990) reported that housing is provided mainly for confinement, protection from bad weather predators and theft. Most of the pig houses are made of local materials and covered with the thatched grass or old zinc. Pigs are sometimes kept on free range, but provided with shelter. The disadvantages of this system are as follows:

i. They are exposed to infestation by parasites.

ii. A large area of land is required.

iii. The surrounding becomes very muddy and the soil surface is disturbed by routing.

iv. The food intake cannot be controlled.

2.2.3 Feeding

Although a pig can eat a wide range of materials, particularly when it is very hungry, the most suitable food for pigs is that the feed must contain all necessary nutritional requirement in a correct balance such as minerals, protein and vitamins (Okorie, 1978). Rekwot et al, (1990) established that in southern Kaduna the feed include "dusa" (bran from cereal crops); cocoyam, cassava peels and remnant of human foods, fresh grass and vegetables. Ridgeon (1960) made it known that cost of feed is the most important factor determining profit level in intensive livestock enterprise. It has been estimated that feed accounts for 75-80% of the total cost of pig production in Nigeria (Deltmers, 1975; Okorie 1978).

2.2.4 Health and Sanitation

Pigs are susceptible to numerous diseases. Pigs may not develop well unless they are maintained in good state of health (Jerome 1973). Many diseases can be prevented

or cured on the farm by applying the basic principles of animal hygiene with assistance from the veterinary service in the area. Diseases of pigs may be prevented by carrying out the following routine regularly:

i. wash the food trough and water troughs thoroughly.
ii. clean out the pen at least once daily.
iii. deworm the animals at regular intervals.

According to Rekwot (1990) Health Assistants from the state ministry offer skeletal services and often do not have the required drugs.

2.3 Transport and Lairage

In Nigeria, pigs are usually transported in any kind of vehicle that can accommodate the pigs (Olomu and Oboh, 1995). They further pointed out that attempt should be made to reduce stresses on the pigs. Pigs should be fed about 12-18 hours before transportation to reduce amount of undigested food faeces in the intestinal tract and improve the keep quality of the meat. The pigs should be sprayed with cold water before loading into vehicle, on reaching their destinations, the animal should be kept in lairage and sprayed with water before they are slaughtered.

2.4 Marketing of Pigs

Olomu and Oboh, (1995) pointed out that the following categories of slaughter pigs are feasible

i. Pork are slaughtered from 90 to 140kg live weight. In Nigeria, most pigs are marketed when they are between 50 and 80kg some producers sell pigs as feeder pigs which they rear to market weight. Feeder pigs are generally 8 to 9 weeks of age with average weight of 10 to 20kg. Olomu and Oboh (1995) further established three main systems of marketing which are:-

   a. Direct sales to local consumers, middlemen, butchers, other pig producers, meat shops or abattoirs. Prices are based mainly on negotiations although some pig producers now fix their prices per kilogramme live or slaughtered weight.

   b. Public sales in central market where the pigs are sold to the highest bidder some form of tax known as "ladda" may be demanded by middlemen from the purchasers. Slaughtered pig cut into small portions are sold in the local markets.

ii. Contract sales where the pig producers enter into agreement to supply pigs to processing firms or meat shops over a period at a set price.

2.4.1 Marketing channels for live pigs

Marketing channels for pigs are the routes in the marketing system through which the animal pass as they move from the producer to the consumers. Ademola (1995) pointed out that pig production unlike cattle production involves continuous full feeding from weaning to slaughter. Often times, the marketing channels are more complicated between producer and meat packer. Tewe and Adeshinwa (1995) established that pigs are sold at farm gate prices or may be taken to near-by markets. Prices are fixed on the basis of visual score. They stressed the fact that there are four outlets for pigs (1) replacement of breeding stock (2) fresh meat market (3) bacon market (4) manufacturing trade market. Apart from the first outlet, the market for pigs is about equally divided between the last three.

2.4.2 Pork marketing

Pork from slaughtering and processing plants must reach the ultimate users for its full economic value to be realised. Hence, in our tropical settings where refrigerating facilities are inadequate hot processing and hot marketing are the order of the day (Abdulaye, 1991). Thus carcasses must be sold off within a few hours of the slaughtering in small lots by meat retailers.

In wholesale trade, large lots of carcasses and processed products are moved from the point of the slaughter and processing centre to retailers, hotels, restaurants and institutions or other consumer points. Pork may also be put on sale and discounted as weekend specials or supported with vigorous advertisements as a mean of luring more customers to the super markets in developed nations.

In general there has been a steady increase in price of pork since 1976. Ogunfowora et al (1980; Pathiraja, (1986) reported that the average price of a weaner pig (8-12 week) is about N40 to N60 and the price of adult pig varies from N100 to N300 depending on the size of the animal.

2.4.3 Profitability of pig production

Okorie (1977), stated that the profitability of pig enterprise depends on the following:

i. Number and weight of piglets reared per sow per year
ii. Efficiency of feeds utilization by the pigs
iii. Rate of growth of pigs
iv. Carcass value of pigs in N per kg
v. Feed cost
vi. Labour cost
vii. Fixed cost (building and equipment
viii. Variable cost medicine and veterinary bills.

2.5 Framework for Analysing Marketing Problems

There are four major approaches to the analysis of marketing problems (Khols and Downey, 1972), They are the functional approach, the institution approach, structure - conduct - performance and the behavioural system approach.

2.5.1 The functional approach

This method classifies the activities that occur in the marketing process into functions. The functional approach is generally divided into the exchange functions, the physical functions and the facilitating functions. The exchange functions includes those of buying and selling. The physical function includes those of storage, transportation, financing, risk-bearing and market intelligence. Khols and Downey, (1972); Ejiga (1977) established that one way to diagnose the problem within the marketing system is to see which functions are constraining and where improvements will yield the greatest dividend.

2.5.2 The institutional approach

The institutional approach is concerned with the nature and character of the various middlemen and related agencies and also the arrangement and organisation of the marketing system Knols and Downey, (1972). Middlemen may

be individuals or business units which perform the various marketing functions outlined above.

2.5.3 The marketing structure-conduct-performance approach

Another framork for appraising marketing system is the structure - conduct - performance approach (Scherer, 1970). Market structure refers to the characteristics of the market which strategically influence the nature of competion and pricing within the market (Clodius et al 1976). Bressler (1964) refers to market structure in a descriptive way, as the physical dimension involved, the appropriate definition of industries and markets. The number of firms and or plants in the markets, the description, and of condition of entry-all of which affect market competition.

Market conduct refers to patterns of behaviour which firm follow in adapting or adjusting to the markets in which they buy or sell (Hays, 1975). Bressler (1964) also defines market conduct as the behaviour of firm under different market structures. Important dimension of conduct include the method employed by firms in determining price and output, product and sales promotion policy.

Marketing performance is the third part of the structure - conduct - performance framework. It is

defined as the appraisal of the extent to which the interactions of buyers and sellers in a market stimulate results that are consistent with social purpose (Marion and Handy, 1973). These results can be measured in terms of price, profits, products and service, volumes, qualities, product innovations and technical progress (Hays, 1975). However, many believe that performance embrace more dimension than efficiency and therefore, should be more generally applicable than efficiency which is more precise (Breimyer 1960; Ejiga, 1977).

2.6 Net Farm Income

This is one of the oldest and simplest tool of analysis in farm production and management studies. Basically, it is an operation leading to estimation of total costs and revenue for the production period (Oluwole, 1970). The aim of the net farm income is to compare how profitable different kinds of enterprise combinations can be (Olukosi and Erhabor, 1988). In reorganising the entire enterprise, complete budgeting is employed while partial budget that is more common is used when introducing a new enterprise into the farm business.

The net farm income general model is presented as

$$NFI = TR - (TVC + TFC)$$

where:

NFl = Net income in naira

TR = Total revenue in naira

TVC = Total variable cost in naira

TFC = Total fixed cost in naira

It is the difference between total revenue and total expenses.

2.7 Margin and Cost Analysis

The term total marketing margin refers to the difference between the price paid by the consumer for one unit of a certain product of a specific quality and the price recieved by the producer for the farm equivalent of that unit. It measures the per unit changes made by marketing agencies and it includes as far as possible, all changes that take place from the farm gate to retail purchase. It is a payment for value added for processing (where applicable), storage, transportation and distribution. Thus, the general term marketing margin refers to the margins between buying and selling pairs for each link in the marketing chain.

Marketing margins are not in themselves a direct measure of efficiency of marketing organisations. They could hoever be used in analysing the performance of most agricultural markets. For example, the United States Department of Agriculture (USDA) usually gives price spread statistics for individual commodities with the

breakdown of the total marketing margins at various stages. According to Williams and Oludimu (1988), the USDA insists that such a breakdown can be used as a starting point for evaluating the food industry's performance if three questions are asked: (a) are the functions for which marketing costs are incurred necessary ones? (b) are the functions effectively performed? (c) are profits reasonable? If the answer in each case is yes, then the price spread is justified and the industry is performing well in this respect.

Marketing costs are the actual expenses incurred in the performance of the marketing functions as a commodity moves from the farm to the ultimate consumers. It includes the costs of transportation and handling, marketing charges, costs of assembling, processing, distribution, costs of parkaging, sales promotion, advertisement costs and other costs such as taxes, levies and excise duties. Marketing costs are often erroneously assumed to be synonymous with marketing margin, but the true relationship is that marketing margin includes marketing costs plus the normal profit or loss earned by the market intermediaries as the commodity passes through the marketing system. Marketing costs consist of fixed and variable costs.

2.8 Marketing Efficiency

Efficiency in the agricultural industry is the most frequently used measure of market performance. Improved marketing efficiency is a common objective of farmers, food marketing firms, consumers and society at large.

Efficiency is an engineering terminology which is measured as a ratio of output to input. Marketing efficiency can be defined as the maximization of ratio of output to input in marketing.

Olukosi and Isitor (1990) established that marketing efficiency can be expressed in both physical and monetary terms. If monetary terms are used the efficiency concept becomes a ratio of benefit to costs.

(a) Marketing efficiency (M.E.) $= \frac{\text{output of pig}}{\text{input of pig}}$

or

(b) $M.E. = \frac{\text{value of output of pig}}{\text{value of input of pig}}$

It is easier to estimate the input cost of marketing than the output of marketing while the input cost of marketing is simply the sum of all the prices of resources used in the marketing process. The best measure of marketing output (consumer satisfaction) is the price consumers are willing to pay in the market for farm products with different levels of marketing utilities.

The higher the efficiency ratio the higher is the marketing efficiency. Any change in the marketing process which reduces the input cost of accomplishing a particular marketing service without reducing the consumers satisfaction is certainly an improvement in marketing. On the other hand, any change in the marketing process which reduces the input cost of accomplishing a particular marketing service without reducing the consumer satisfaction is certainly an inprovement in marketing.

Efficiency has been divided into two types namely operational efficiency and pricing efficiency.

2.8.1 Estimation of pricing efficiency

Marketing Efficiency can be estimated by analysing price behaviour over time and space. In a perfectly competitive market price differential over time must be equal to cost of storage. If the difference in price over time is greater than the storage costs it indicates pricing efficiency. Over space, the law of market area stipulates that price spread between two markets that trade with one another should not exceed the cost of transfer of the products between the locations where price differential over space is in excess of transfer cost it represents pricing inefficiency.

2.9 Measuring Market Power

In terms of market organisation, industries fall along a spectrum from perfect conpetition to pure monopoly. Market power signifies the degree of control that a single firm or a small number of firms has over the prices and production decisions in an industry.

2.9.1 Concentration ratios

In pure monopoly, the concentration ratio would be 100 percent, while for perfect competition, the ratio would be close to zero. The firm concentration ratio is defined as the percent of total industry output that is accounted for by the largest firms.

2.9.2 The Herfindahl Index

The Herfindahl index reflects the effect of the size differences of the firms in an industry. It is equal to the sum of the squared market shared in percentages terms.

$$H = \sum_{i=1}^{n} S_i^2 = S_1^2 + S_2^2 + \ldots\ldots + S_n^2$$

Where H = Herfindahl index

s_i is the percentage market share of the ith firm. When there is more monopoly, the $H = 100^2 = 10000$ while if an industry is perfectly competitive the Herfindahl index is equal to zero.

2.10 Marketing Agencies

Marketing agencies or intermediaries carry out marketing functions or offer marketing services. Olukosi and Tsitor (1990) established that marketing agencies are middlemen involved in carrying out the marketing functions. They could be individuals or agribusiness organisation that specialise in performing the various marketing functions involved in the purchase or sale of goods as they are moved from producers to consumers.

Marketing middlemen could be calssified into four broad groups namely:

a. Merchant middlemen
b. Agent middlemen
c. Speculative middlemen
d. Processors and manufacturers

2.10.1 Marchant middlemen

This group of middlemen takes title to and owns the goods it handles. The merchant middlemen buy and sell for their own gain. Examples of merchant middlemen include the rural buyers, wholesalers and retailers

2.10.2 Rural buyers

This group of middlemen undertakes the initial task of assembling produce from farms or local rural markets. The rural buyer may either act on commission or purchase on his own account.

2.10.3 **Wholesalers**

The wholesalers have a central role to play in a marketing system. They take the product from farms or rural buyers and sell to retailers and to other wholesalers in the domestic and foreign markets and to processors and manufacturers.

2.10.4 **Retailers**

The main function of the retailer is to obtain supplies and display them for sale in forms and at times and places convinient for the consumers. Usually the retailer buys from one or more wholesalers, sometimes on credit and serves consumers who buy smaller quantities on day to day basis.

2.10.5 **Agent middlemen**

These groups of middlemen act only as representative of their principal or their master. They do not normally take title to and therefore do not own the product they handle.

2.10.6 **Commission Agents**

Producers and wholesalers frequently want to offer their produce in markets where they cannot conveniently attend in person. Commission agents specialise in buying for such people and take charge of the goods on their

behalf. Commission agents do not normally bear marketing risks since they are operating for their principals.

2.10.7 **Broker**

This group of middlemen brings potential buyers and sellers together. The function of this group is to provide an intimate knowledge of supplies, requirements and prices in various markets. They are very well informed.

2.10.8 **Speculative middlemen**

This group of middlemen buys the products with the aim of selling them at a time when prices rise. They often attempt to earn their profit from short-run fluctuations in prices. Other names used for speculative middlemen are hoarders and spreaders. They buy when prices are low and resell when prices rise.

2.10.9 **Processors and Manufacturers**

These are mainly agribusiness firms that undertake some action on farm products to change their form. Sometimes they function as buying agents in the producing areas.

CHAPTER 3

METHODOLOGY

3.1 Study Area

This study was conducted in Zango Kataf Local Government Area of Kaduna State. The area was carved out of the defunct Kachia Local Government on 27th May 1989 and has its headquarter in Zonkwa.

It has a population of about 149,000 people according to the 1991 population census. It falls between latitude 09° 30'N and longitude 08°30'E. The rainy days last between 190 to 200 days with distinctive dry and rainy seasons. Prominent among the crops grown in this area are maize, millet, guinea corn, yam, beans, soyabeans, ginger and groundnut. The livestock reared in the area are goats, sheep, cattle, pigs, chicken and ducks.

The location was specifically chosen for several reasons. Firstly, majority of the farmers in the study area were involved in pig production. Out of the total of 2368 farm families identified in Zango Kataf L.G.A., 1804 representing 75% rear pigs (KADP, 1990). Secondly the area is a known potential pig market in the country. Thirdly, the area is easily accessible to the researcher and fourthly the indigenes can communicate in different dialects.

3.2 Data Collection

The information for this study were collected between May and August of 1997. Primary data used for this study were collected through the aid of structured questionnaire. Kaduna State Agricultural Development Project Extension Workers who are more accessible to the farmers assisted in the data collection.

Data were collected on variables which include the following:

i. Socio-economic variables

Data on the stated sub-heading collected from pig farmers included, family size, educational level, age, years of experience

ii. Production and marketing variable

Data on fixed inputs that were collected included shelter/housing, farm equipment and tools, land size in hectares, repairs and maintenance cost.

Information on variable inputs which were collected included number of piglets, drugs, feeds, labour, veterinary cost and breeding cost.

Data on swine output were collected as follows: Live weight of pig in kilogrammes carcass value of the slaughter pig in naira, piglet per litter.

Data on marketing variables collected from pig farmers and distributors alike included the following: prices of pigs and products (₦), values of sales (₦),

transportation cost (₦), marketing charges (₦), loading and offloading charges (₦), (Amputs), tapeworm inspection cost (₦) and butchering.

3.3 Sampling Technique

A total of 90 pig farmers were selected out of the 1804 using random sampling techniques. A total of 30 pig traders were randomly selected from a population of 150 distributors in the study markets. The factors that influenced the choice of farmers and traders sample size include the population size of each category, accessibility to the research and cost.

A total sample for the study therefore was 120 consisting of 30 traders in Katsit, Zonkwa and Samaru Kataf and 90 farmers (Primary producers) in the study area.

3.4 Analytical Techniques

For the purpose of this research, the techniques employed were as follows:

3.4.1 Descriptive statistics

Simple descriptive statistics such as percentage means, tables, frequency distribution and standard deviation were used to group responses according to specific criteria. It was used to analyse parameters

such as farmers' age, level of education, household size, problems of pig producers and marketers.

3.4.2 Farm budgeting

This is mainly an operation leading to the estimation of the total costs and revenue for the same period. The farm budget model is commonly used for analysing the profitability of farm production practices.

The equation for obtaining net farm income can be stated in the following manner:

NFI = TR - (TVC + TFC) where

NFI = Net farm income of the farm in (naira)

TR = Total return or revenue in (naira)

TVC = Total variable costs in (naira)

TFC = Total fixed costs in (naira)

Net farm income signifies the difference between total returns in naira for the farm and total expenses of production of the enterprises.

3.4.3 Gini coefficient

The Gini Coefficient technique that gives a more precise measure of the market structure was employed to measure the level of buyers and sellers concentration in the market in order to determine the degree of competition or monopoly in the market (Okereke and Anthonio, 1988).

The Gini coefficient is given by:

G.C. = 1-Σxy

Where:

x = percentage of distributors of pigs per period of study.

y = cumulative percentage of all distributors' sales or revenue per period of study.

The Gini Coefficient ranges between 0 and 1. A Gini Coefficient of 0 implies perfect equality in distribution, while a coefficient of one means perfect inequality. The closer the value is to unity, the greater the degree of inequality and therefore, the higher is the level of concentration .

3.4.3 Marketing performance measurement techniques

Marketing margin and marketing efficiency were used in measuring the marketing performance in the study area.

3.4.4 Marketing margin

Marketing margin refers to the difference between the prevailing prices at the two ends of the marketing ladder at the time when transactions take place. The marketing margin shows the fraction of the consumer expenditure on a commodity that is received by the producer and each of the marketing agent. The marketing margin is used to give a close approximation of the

market performance. The marketing margin can be expressed either in nominal terms or in percentages. The percentages was used in this study to aid the achievement of objective three. It was given by:

$$\text{Marketing margin} = \frac{\text{selling price - supply price x 100}}{\text{Selling price}}$$

where:

selling price is the retail price

supply price is the producers' price

3.4.5 Marketing efficiency

Marketing efficiency can be defined as the maximization of the ratio of output to input in marketing. Marketing inputs include the resource used in providing marketing services etc. on the other hand, marketing output include time, form, place and the possession utilities which consumers derive from the marketing of the products. Thus, marketing inputs are the cost of providing marketing services whereas the market output are the benefits or satisfaction created or value added to the commodity as it passes through the marketing system (Olukosi and Isitor, 1990).

In this study, the efficiency of marketing was measured in percentages for Katsit, Zonkwa and Samaru markets to achieve objective three.

The formula specified for marketing efficiency is as follows:-

$$M.E. = \frac{\text{value added by marketing}}{\text{cost of marketing services}} \times 100$$

Value added is measured by the prices that consumers are willing to pay in the market for farm products. Marketing cost is measured by cost of resources used in providing marketing services in naira.

The ratio was used to compare with what was obtained in Katsit (main market), Zonkwa and Samaru (rural markets).

CHAPTER 4

DATA ANALYSIS AND INTERPRETATION OF RESULTS

In this chapter, analysis and interpretation of the results were carried out. Out of 90 questionnair administered to farmers, 85 were found fit for analysis in addition to the 30 served to marketers.

4.1 Socio-economic Characteristics and productivities of farmers

The production activities and marketing decisions are both influenced by numerous factors which include the following:

1. Farmers inherent socio-economic characteristics
2. Access to resources and the technology of production
3. Socio-economic environment under which farmers perform such as market prices, climatic elements and government policies. Most of these are outside the control of the farmers. The objective of this subsection of the study is therefore, to examine the socio-economic characteristics and production activities of the study farmers.

Table 4.1: Age distribution of pig farmers

Age	Frequency of respondent	% of Respondent	Mean herd size
21 - 30	9	10.59	2.55
31 - 40	26	30.59	2.73
41 - 50	31	36.47	2.93
51 - 60	11	12.94	3.00
Above 60	8	9.41	2.87
Total	85	100.00	

Source: Survey Data, 1997

Table 4.1 shows that age does not affect production of pigs since the lowest age group 21-30 years has a mean pig herd size of 2.55, while the group above sixty years has 2.87. The group with the highest pig herd was found within 51-60 years. The result shows that age does not influence the number of pigs that individuals reared.

Table 4.2: Family and herd size of the swine farmers in Zango Kataf LGA Kaduna State

Family Size Range	No. of respondents	% of Respondent	Mean herd size
1 - 5	33	38.82	2.84
6 - 10	38	44.70	2.84
11 -15	11	12.94	4.09
16 -20	3	3.53	3.33
Total	85	100.00	

Source: Survey Data, 1997

Family size refers to the members, from the age of seven years in a family that were engaged in productive activities. Table 4.2 shows that 38.82% of the respondents fell within the range of 1-5 members per household, while 44.70, 12.94 and 3.33% fell within the range of 6-10, 11-15 and 16-20 respectively.

The result indicated that the more the family size the more the number of pigs reared as for family size group of 11-15 and 16-20 respectively in Table 4.2.

Table 4.3: Distribution of pig farmers by herd size

Herd Size	No. of Respondents	% of Respondents
1 - 3	59	69.41
4 - 6	20	23.53
7 - 9	6	7.06
Total	85	100.00

Mean 3.5, Standard deviation 1.6

Source: Surve Data, 1997

Table 4.3 shows that majority of the respondents (69.41%) had less than four adult pigs while 23.53% had 4-6 pigs. The mean herd size of the three classes was 3.5 and a standard deviation of 1.6. The results shows that all the respondents were small-scale farmers considering their farm herd sizes.

Table 4.4: Distribution of pig farmers by level of education and herd size In Zango Kataf LGA, Kaduna State

Level of Education	No. of Respondents	% of Respondents	Mean herd size
Adult Education	31	36.47	2.80
Primary or Secondary Education	26	30.59	2.76
Never gone to School	23	27.06	3.17
Tertiary Institution	5	5.88	3.40
Total	85	100.00	

Source: Survey Data, 1997

The overall educational level of the respondents as presented in Table 4.4 shows that a large number of the pig farmers are literate. They could read in Hausa or English language. There was, however no significant difference between the mean herd size of 3.17 for the illiterate farmers and 3.40 for those farmers who attended tertiary institutions.

Table 4.5: Distribution of farmers according to their other sources of income

Type of Employment	No. of Respondents	% of Respondents
Crop Farming	75	88.24
Civil Service and Crop Farming	5	5.88
Trading/Crop Farming	5	5.88
Total	85	100.00

Source: Survey Data, 1997.

Besides swine production which is on part-time, the farmers studied had other sources of income as indicated in Table 4.5. These additional sources of income include crop production, petty trading and wage earning.

The bulk of the farmers (88.24%) depended mainly on farming while 5.88% in both cases were civil servants and traders who also engage in part-time crop production. Income from these other economic activities are used by the farmers for funding swine production.

Table 4.6: Distribution of pig farmers according to sources of land

Source	No, of Respondents	% of Respondents
Inheritance	75	88.23
Leasing	10	11.76
Total	85	100.00

Source: Survey Data, 1997.

Table 4.6 shows the two major sources of land tenure in the study area. About 88% of the respondents acquired their land through inheritance while 11.76% acquired theirs through leasing. This is so because the land for pig production in the case of these small scale farmers is always small in proportion and linked to the home since pigs are domestic animals.

4.2 Resource Use

4.2.1 Land requirement

Land is an important input for farming under both subsistence and large scale farming. Pig farmers in the study area were found to have been using part of their backyards for the production which points to the fact that small proportion of land is used for the production. Though some farmers embarked on extensive system of pig rearing during the dry seasons, the confinement of pigs during the cropping periods restrict their need of land usage. The average size of land used for pig production was found to be 0.108 hectares. The size of land devoted for swine indicated that desired land for swine production is low as they can be managed on small plots. Similar findings were reported by Rekwot et al (1990).

4.2.2 Labour requirement

The type of labour used on swine farms was family labour only. For the purpose of conversions the average labour spent on the farms in the study area was 5 hours per day at the rate of ₦50 each day.

The effective working hours was converted by using the ratio 0.5, 0.75 and 1 for the large children, female and male adult respectively as adopted by Norman (1973).

Male adult contributed more average labour 254.2 man hours (46.58%) followed by female adult (30.97%) as shown in Table 4.7. Provision of feeds to the pigs requires knowledge of the exact amount that they require each feeding period so as not to waste the resource, and has to be done timely so as not to subject the pigs to unnecessary hunger. The clearing of pens and daily observation of the performance of the swine is also done by the adults. Perhaps the above reasons explain why children spent less labour in swine production because they are only involved in provision of feeds for the swine.

Table 4.7: Distribution of labour in pig production by gender in Zango Kataf LGA Kaduna State

Person	No. of Respondents	% of Respondent	Average man-hrs	% of Total man-hrs
Adult male	44	57.76	245.76	46.58
Adult female	32	37.65	169.03	30.97
Large child	9	10.59	112.73	22.45
Total	85	100.00	545.73	100.00

Source: Survey Data, 1997

4.2.3 Feed requirements

Feeds consisted mainly of brans of grain crops cultivated in the study area. The bran called "Dusa" in Hausa Language is commonly derived from sorghum, maize, millet, rice and soyabean. All the studied farmers were found to be using sorghum bran, followed by maize bran (96.50%). Besides the major sources, three other sources of "dusa" as indicated by the sampled farmers were rice (42.35%), millet (41.17%) and soyabean (34.11%).

During the study period the bran cost ₦4.50 per mudu or ₦450 per bag which weighed 56kg per bag on the average. The cost of the bran per kilogramme was ₦8.00. Other minor sources of feeds for the pig production include waste peels from root crops such as cassava, cocoyam, yam etc. These other sources were difficult to

estimate or cost as they have no market value and are only seasonal.

4.2.4 Housing

Majority of the houses were found to be of local materials such as mud bricks and grass roof. The housing was found to be essential for successful swine production as poor housing can result in faster disease incidence during the rainy periods. Poor housing was also reported to result in death of piglets as they are not comfortable under rains or excessive sunshine. the houses were found to have a life span of about 5 years with continuous yearly repairs. A few which were made of used zinc sheets and concret bricks stay up to 10-15 years with continuous repairs and maintenance depending on need.

4.2.5 Piglets

Piglets differed in terms of size, only, but were similar regardless of age, however, farmers were found to go for improved breeds as long as they were available. Piglet which constituted one of the major resources needed for starting pig farms were mainly of two type, cross breeds and local types with those of local genotype being majority as it is scarce to come by the improved breeds. The average price was found to be N915 per piglet.

Sampled farmers obtained their input/dusa, veterinary services and drugs, piglets, breeding services from government agencies such as Kaduna State Agricultural Development Project, Local Government, State Veterinary Services) open market, personal farms, neighborhood, battered market and gift.

The result shows that open market and personal farms were the principal sources of feeds and piglets. Table 4.8 shows that government agencies no longer served as sources of piglets and feeds to the farmers. The major role played by government agencies was in provision of veterinary services and drugs. Other supplementary sources of "dusa" were gift (15.29%) and barter (1.18%) which indicated that while relations can sympathise and donate some feeds to an individual, they sometimes exchange "Dusa" for grain or other items. The implication of the finding is that since piglets, and standard feeds are not available from government, farmers employ the use of poor genetic breeds and low quality feeds which account for longer period of raising pigs to market sizes for 12 months insted of 6 months there by increasing cost of production. Similar findings were reported by Jerome (1973).

4.2.7 Production financing

Swine production is a highly capital intensive enterprise particularly when production is intensive as

commonly found in government farms and large holder farms. The study showed that capital was grossly inadequate for the small scale farmers who grew pig at their backyard. All the respondents indicated that they needed money in accomplishing one operation or the other. About 93% of the sampled farmers source finance for pig production from their personal savings. This constituted the major source of fund for pig production, followed by funds from partnership (4.70%).

Credit either from bank or rural money lender formed an insignificant source of financing pig production with each representing about 1% of the sampled farmers as shown in Table 4.9. Finance was discovered to be employed in constructing houses, procurement of breeding stock, veterinary attention, farm tools and feeds. The average amount of funds in naira acquired and used by farmers is in Table 4.9.

Table 4.9: Distribution of farmers by their sources of finance in Zango Kataf L.G.A.

Source of capital	No. of Farmers	% of Farmers	Average(₦)
Personal saving	79	92.94	3640
Partnership	4	4.70	915.00
Credit from bank	1	1.18	2500
Credit from rural money lender	1	1.18	10000
Total	85	100.00	

Source: Survey Data, 1997

4.3 Cost - Return Analysis

The net return of the farms is considered as the total revenue less total costs. The various cost and revenue in pig production are discussed and estimated as represented in Table 4.11.

4.3.1 Variable costs

These are the costs incurred on the variable resources and they vary according to output of specific enterprises and so the variable cost component of the average total cost was found to be higher than the fixed costs. The average cost of feeds (₦2685.55) was found to be the highest major item that cost highest followed by labour (₦2065.05) per farmer.

4.3.2 Fixed costs

The fixed costs are expenses incurred on the farm irrespective of whether the farm is in production or not. These costs do not vary with the level of production. The cost items considered as part of the fixed cost were the maintenance and repairs of building and equipments, depreciation of building and tools.

Table 4.10: Items of costs in pig production and percentages of total cost for all sampled farmers.

Item	Total cost (₦)	%
Feeds	228,272	32.65
Labour	175,530	25.10
Drugs and Vet. Services	37,310	5.34
Hired boar	6,250	.89
Clipping/Castration	5,243	.75
Swine death	17,542.2	2.51
Pig purchase	207,250	29.65
Repairs and maintenance	1750	0.25
Depreciation on building	15,048.7	2.15
Depreciation on tools	4,879.4	0.70
Total	699,075.3	100%

Analysis of the total cost of production indicates that feeds rank highest followed by purchase of piglets (29.65%) and labour (25.10%). Other variable items are negligible.

4.3.3 Gross revenue accruing to farmers

The gross revenue accruing to the farmers is made up of all proceeds realised from the sales of swine. The mean of the total revenue was found to be ₦9,384.06. per farmer.

4.3.4 Net farm income of pig farmers

This aspect of the study gives a summary of the costs and returns for pig production and consequently the net farm income. The net farm income was obtained by subtracting both the total variable costs and the total fixed costs from the total revenue. The net farm income gives a measure of farm profit obtained for swine production.

Table 4.11: Average revenue and cost of swine production in naira.

Description	Mean	Standard Deviation
Revenue from Pigs		
Piglets (Num.)	5896.66	2151.27
Adult pigs(Num.)	9080	6733.4
Total Revenue	9384.06	7009.41
COST OF PRODUCTION		
Feeds (Kgs)	2685.55	2116.26
Labour man/hrs	2065.05	1016.25
Drugs and Vet. Services	438.94	398.35
Hired mating boar	892.85	142.6
Clipping and castration	62.4	35.73
Maintenance & repairs	64.80	32.30
Swine death	1949.13	951.37
Depreciation on buildings	177.04	128.86
Depreciation on tools	64.2	40.95
Purchase of piglets	2385.29	1740.48
Total cost of production	8117.55	5,014.65
Net income	1185.65	3623.62
Net income per pig	35.27	822.73
Net income per man hour	4.71	15.
Net income per naira	0.142	0.56

Source: Survey data, 1997

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The average net farm income of the sampled farmers obtained from swine production was ₦1185.65. This income figure may appear low but the families keep the animals for security reasons to meet emergencies. The results also agree with Williamson and Payne, 1978) who established that in most tropical countries in the past, the indigenous producers did not attempt to obtain maximum productivity from their pigs but managed them primarily as scavengers.

4.4 Marketing Activities

4.4.1 Market structure and conduct

The market structure depicts the underlying characteristics of a market which determine competitive relationship among buyers and sellers and the nature of pricing in the market. It also concerns the relationship between present and potential producers in terms of entry into and exit out of the industry. Conduct refers to the pattern of behaviours of the firm in adjusting to market conditions. Conduct and structures are therefore related. It is based on this existing relationship that we can observe, measure and analyse the degree of concentration among distributors of swine. Hence, the structure and conduct of the market arrangement is discussed below.

The structure is discussed under the following:

i. number and size distribution of buyers and sellers
ii. barrier to entry
iii. nature of product
iv. degree of vertical integration
v. market information

4.4.2 Number and size distribution of buyers and sellers

The market was found to have numerous buyers and sellers because of easy entry and exit. Size distribution of wholesalers and retailers are represented in Tables 4.12 and 4.13 respectively. Pig wholesaling and retailing in the study area can be said to be imperfect competition (monopolistic) because the Gini Coefficients are in the middle range (0.51 for wholesalers and 0.50 for retailers). Empirical findings indicate that there is moderate degree of concentration in the markets by both wholesalers and retailers.

4.4.3 Barrier to entry

Kotsoyannis (1979) refers to barrier to entry as the technical and economic conditions in the market which raise cost of firm intending to enter the market above the cost of firms already in it. This makes entry into it difficult. Barrier to entry into the swine

production in terms of cost was found to be low because fixed cost of production such as maintenance and repairs, depreciation on buildings and tools were low. Consequently entry was found to be relatively easy and so also is the exit.

There was no monetary barrier to becoming a commissioned agent because the agents purchase with funds supplied by the pig merchants. It was found that the requirements for becoming a pig trader were integrity, honesty, experience and confidential relationship among all participants as demanded by marketers and market officials. Becoming a wholesaler demanded more money and risks than retailers.

4.4.4 Vertical integration in the market

Olukosi and Isitor (1990) established that vertical integration is a form of concentration of power in few firms and could be anti-competition because it may make entry more difficult for potential competitors thereby giving the integrated firm power to influence price.

It was found that 5 out of 9 pig assemblers sampled were pig producers and 4 out of those 9 were occasionally embarking on wholesaling. Six out of 11 retailers were found to engage in pig production as well as assembling. Twenty eight of them were also found to engage in buying and selling particularly butchers at the village level.

The market could therefore be said to be vertically integrated since production and marketing decisions are being coordinated by the same farmers in the industry.

Table 4.12: Distribution of swine wholesales by value of monthly sales in Zango Kataf L.G.A.

Sale range (N)	Number of wholesales	% of whole-sales (x)	Cum %	Total value monthly sales (N)	% of total sales	Cum .% (y)	Σxy
0-49,000	5	26.32	26.32	145,812.8	9.77	9.77	0.0257
49,001-98,000	8	42.10	68.42	527,384	35.33	45.10	0.1898
98,001-147000	5	26.32	94.74	571,251	38.27	83.37	0.2194
Over 147,000	1	5.26	100.00	248,192	16.63	100.00	0.0526
Total	19	100.00		1492639.8			0.4875
Gini coefficient = 1-0.4875 = 0.5138							

Source Survey Data, 1997.

Table 4.13: Distribution of swine retailers by value of monthly sales in Zango Kata

Sale range (N)	Number of retailers	% of retai-lers (x)	Cum .%	Total value monthly sales (N)	% of total sales	Cum .% (y)	Σxy
0-49,000	1	9.09	9.09	24,819	1.76	1.76	0.0015
49,001-98,000	3	27.27	36.36	198,553	14.07	15.83	0.0431
98001-1960000	4	36.36	72.72	480,344	34.04	49.87	0.1813
Over 147,000	3	27.27	100.00	707,347.2	50.13	100.00	0.2727
Total	11	100.00		1411063.2	100.00		0.4986
Gini Coefficient = 1-0.4986 = 0.502							

Source: Survey Data, 1997

4.4.5 Market information

In the studied markets, all buyers and sellers sampled indicated that they had prior knowledge of prevailing prices before they either sold or bought a pig. About 87% of the traders source information on pig prices from fellow marketers, 10.00% received information on prices from farmers only and only 3% received information from market officials. On usefulness of price information, majority of the pig farmers (80%) rated it very important and only (20%) rated it important. It was therefore concluded that information which is important to both traders and farmers alike is mainly spread by the marketers as indicated in Table 4.14.

Table 4.14: Distribution of pig marketers according to sources of price information in Zango Kataf LGA

Source of information	No. of Marketers	% of Marketers
Pig marketers	26	86.67
Farmer	3	10.33
Market official	1	3.33
Total	30	100.00

Source: Survey Data, 1997

4.5 Marketing Participants

The principal participants in swine marketing identified in this study were producers, rural assemblers, wholesalers, commission agents, retailers and consumers.

4.5.1 The producers

The producers were mainly small holders who reared pigs purposely for marketing to supplement other cash crop production such as groundnut, ginger, rice and soyabean. The market has many farmers selling about 1 to 2 pigs at a time and normally once in a year.

4.5.2 The rural assemblers

Rural assemblers constituted those who purchased pigs from producers and in local markets such as Zonkwa and Samaru markets and then sell or transport to the main market at Katsit. The assemblers were principally private individuals whose sources of finance were personal savings and loan from individuals. The number of purchases ranged from 3 to 5 pigs.

The operational activities of the rural assemblers in addition to buying and selling of pigs included butchering, organisation of trade unions, and educating fellow members on price information in various markets. The rural assemblers were also speculators in the sense

that they bought pigs in locality where prices are low and transported them to markets where the prices are high but they do not involve in distant cities marketing. It was also found that pig merchants also referred to in this study as urban wholesalers employed the services of rural assemblers to source and purchase pigs in rural communities and various market for them. Besides purchasing the agents also help in handling and transportation to near-by markets. Agents, though fewer than both assemblers, wholesalers and retailers, play an important role in the marketing system. The employed agent received up to ₦50 per pig as reward for their roles. This is called "ladda" in the Hausa language.

4.5.3 Urban wholesalers

Urban wholesalers play a key role in pig marketing since the assembling of the pigs in production centres and local markets are to make them available for this category of distributors. They purchase in large number of 15 to 25 pigs, and transport them in open air vehicle to consumption centres and main markets for retailers and other consumers like hotel managers and butchers who sometimes buy from them. Urban wholesalers are category of traders that employed the services of commissioned agents to aid their trade principally because of language barrier, accessibility to producers and handling.

4.5.4 Retailers

This category of distributors was identified to be in operation at the village level in various pig markets. Most of them only buy and slaughter the pigs to be sold as warm pork. During the research period, it was found that butchers were involved in marketing of pork products such as warm pork (fresh state), cooked and roasted called "tsire" in Hausa language. It was also found that butchers in rural areas bought mostly diseased pigs which could not be transported to distant markets, while retailers prefer healthy pigs. They normally do not employ the use of scales in selling the pork.

4.5.5 Consumers

All the efforts of producers and marketers are to make pork available to consumers.

The consumers are noted to buy in small lots of ₦50 to ₦150 for home cooking at Zonkwa and Samaru Kataf. Already cooked pork sold in the market are bought in small portions from ₦5 to ₦20 and are eaten immediately.

4.6 Market Conduct

4.6.1 Buying and selling activities

Buying and selling activities of swine in the study area take place under free market system. It was found that only in Katsit market that the government erected

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some offices and few shades for the benefit of the distributors. The management of the market was done jointly by officials of the pig marketers' association and local government officials.

Katsit market and two other local markets located at Zonkwa and Samaru Kataf were held once in a week as indicated in Table 4.15.

Table 4.15: Distribution of pig markets and market days in Zango Kataf LGA

Market	Market Day	District
Katsit	Thursday	Ungwa Rimi
Zonkwa	Saturday	Zonkwa
Samaru	Tuesday	U/Gayya

Source: Survey Data, 1997

Table 4.15 indicates that pig markets in the study area are allocated in three different districts namely Ungwarimi, Zonkwa, and Ungwa-Gayya. In each of the districts the markets come up once a week as shown in Table 4.15.

Farmers were required by market officials to take pigs to the respective markets for sale to any category of the distributors but it was found that some farmers sold their produce at the farm gate while others preferred to transport theirs to the Katsit market where they expected higher prices. The situation is so because

there were no stipulated marketing arrangements. In some instances, buyers followed farmers to their home in order to make purchases. Being a free market system which is competitive there was no restriction in time and place of buying and selling.

It was found that some marketers bought pigs directly from farmers (55.67%). Also, 23.33% bought pigs either from rural assemblers, retailers or farmers. About 13% bought pigs from rural assemblers while only 6.66% from rural assemblers and farmers.

Majority of the farmers (63.67%) were found to sell pigs directly to urban wholesalers while only 36.33% sold directly to either rural assemblers retailers or wholesalers.

Two different sale agreements were noted between buyers and sellers depending on the existing relationship between the parties. While most of the farmers sampled generally sold on the basis of 'cash and carry' condition some sold on credit. Farmers sold on credit to reliable customers who might not be in possession of cash at the time of which the pig were required to be conveyed for marketing in a distant, town or in situation where the pig was diseased and needed to be disposed off by the farmer. The farmer allowed about one week grace for payment. The average price of the adult pig was ₦3102.4 and the average weight of 74.3 kilogramme. Piglet sold

from ₦700 to ₦1000.00 depending on the health condition with average price of ₦915.

4.6.2 Price determination

It was found that the values of pigs and products were not fixed but arrived at by higgle and haggle (Olukosi and Isitor, 1990). The ability to make a good purchase depends on the experience of the purchasers, while the price depends on 'feeling', observation and the amount of flesh the animal has. Sex, breed and age were not found to be factors influencing the pricing as the quality of flesh and the health which are the principal factors. During pricing, other buyers and sellers could contribute in the estimation in order to arrive at acceptable prices for sellers and buyers.

4.6.3 Inspection of marketed pigs

Although there were no grading of pigs, there was a consistent process of inspection carried out after buying and selling. All buyer indicated the need for pig inspection as it is done to identify those habouring tape worm cysts. The presence of the cyst is identified in the tongue or behind the ears in chronic cases appearing as grains. After price negotiation, the inspection would be carried out by opening the pig's mouth to identify and count the number of cysts. This is done by self-employed

individuals who would later be paid the sum of ₦10 per pig by the buyers in Katsit market and ₦5 per pig in other markets. Having discovered the existence of cysts in the pig, the buyer then demand for a reduction in the price since the pig may be declared unfit for human consumption for the fact that the disease is zoonotic.

All other diseases are not treated as serious as the tapeworm infection since they quickly show on the health of the pig and also for the fact that most are not zoonotic. Price reduction due to infection of tapeworm range from ₦50.00 to ₦250.00 depending on the number of the grains and the agreed price of the pig.

4.6.4 Union activities

The marketers have association called National Union of Pig Marketers with its headquarter at Kafanchan with branches in different towns in the country. Becoming a member is not compulsory since non-members are allowed to buy and sell in the markets. The duties of the union to members are as follows:

i. To help members in time of problems (marketing or family issue)
ii. Lend money to registered members for trading depending on the demand and amount in the treasury.

iii. Advise members to behave well and also discipline those found to show misconduct in the market.

iv. To educate members on pig prices. Registered members pay ₦500.00 as dues per year.

4.6.5 The marketing channel

A marketing channel is the path commodity follows from its raw form to the finished form or the path of a product as it moves from the producers to the final consumers. Marketing channels are useful in understanding the marketing system and the relationship of the market agencies, sources of supply and outlets to each other.

The basic stages of the marketing process of pigs in the study area was found to be similar to what is obtainable for other agricultural products, though each product has a unique pattern based on the agencies and the different uses a product is subjected to. The pig channel was found to be decentralised because wholesalers and processors purchase directly from farmers. This situation is typical of agricultural products as reported by Olukosi and Isitor (1990). The agencies involved in the marketing as earlier pointed out were producers, rural assemblers, urban wholesalers, retailers (butchers), marketing agents and consumers. Figure 4.3 shows the pig marketing channel.

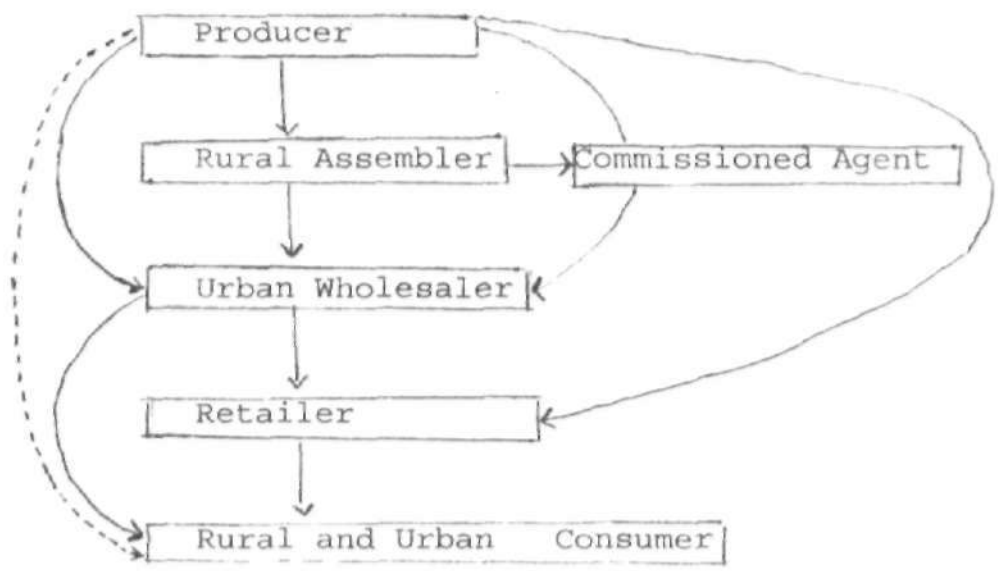


Fig. 4.1 Marketing channel for pig in Zango Kataf LGA, Kaduna State

——————————> main channels

----------> unimportant channels

Source: Survey Data, 1997.

The marketing channel provides the path by which urban consumers receive pigs from producers. For the urban consumers, the pigs have to pass through middlemen to the consumers. This is the channel referred to as main channel in Figure 4.1.

4.6.6 Empirical finding

With the market structure and conduct discussed, it was difficult for a single buyer or seller to raise prices by his action alone. From the above facts it was concluded that the present structure and conduct of the market was free and highly competitive.

4.7 Market Performance

Adekanye and Olayinde (1988) defined market performance as the assessment of the market in terms of the norm of marketing efficiency, progressiveness, innovation and employment generation.

Two measures namely, marketing margin and marketing efficiency were employed in this study to measure market performance.

4.7.1 Marketing margin

Marketing margin represents the difference between what the consumer pays for a commodity and what the farmer gets.

Table 4.16: Average prices and costs in naira per pig at Zango Kataf LGA.

Marketing Prices/ Costs	Katsit	Zonkwa	Samaru Kataf
Producer	3530	3250	3200
Rural Assembler	3655	3360	3295
Commission agent	50	50	50
Transport cost and handling	100	100	100
Market charges	5	5	5
Tapeworm inspection	10	5	5
Cost of butchering	130	95	80
Wholesale price	4550	3815	3785
Retail price	4850	3980	3985

Source: Survey Data, 1997

Empirical findings indicate that producer's share of what the final consumer paid was high (78.25%). The average marketing margin was about 22%. The wholesalers' marketing margin was higher than that of the retailers. The margin at Katsit market (27%) was higher than both at Zonkwa and Samaru as shown in Table 4.17. Considering the services provided in the marketing of pigs the contribution of the margin was considered fair in comparison to costs of marketing and the percentage received by the farmers compared favourably to that of other agricultural products.

Table 4.17: Average marketing margin per pig in percentage of markets in Zango Kataf L.G.A.

Market Participant	Katsit	Zonkwa	Samaru Kataf	Average
Producer's share	72.78	81.66	80.30	78.25
Assembler's share	2.58	2.76	2.38	2.57
Cost of Marketing	6.08	6.40	6.02	6.16
Wholesaler's share	12.37	5.03	6.27	7.89
Retailer's share	6.19	4.15	5.02	5.12
Consumer's share	100.00	100.00	100.00	100.00
Market margin	27.22	18.34	19.70	21.75

Source: Survey data, 1997

4.7.2 Marketing efficiency

This technique is used to measure the extent of marketing efficiency for various commodities. It is the maximization of an output - input ratio when the output is consumer satisfaction or utilities created in marketing system and the inputs are the different resources (Adekanye and Olayinde, 1988). Olukosi and Isitor (1990) established that efficiency is maximized when the ratio of output to input and that of benefits to cost are maximized. A limitation of this technique is that while cost of marketing services can be measured especially, the benefits which are represented by consumer satisfaction cannot be measured in a similar

way. Inspite of this limitation, it is widely adopted as a measure of marketing efficiency.

The result shown in Table 4.18 indicate that Katsit market (447.45%) was more efficient than both Zonkwa and Samaru Kataf markets which are more of rural markets and attract less buyers and attention unlike the main market. It is then concluded that based on the margins and efficiency ratio, the pig marketing is both efficient and profitable.

Table 4.18: Marketing Efficiency at Zango Kataf L.G.A.

Prices/cost	Katsit	Zonkwa	Samaru Kataf
Producer's price (₦)	3530	3250	3200
Cost of marketing	295	255	240
Retail price	4850	3980	3985
Value added	1320	730	785
Marketing efficiency	447.45%	286.27%	327.08%

Source: Survey Data, 1997

4.8 Problem of Pig Production and Marketing

Some basic problems faced by pig farmers in the study were identified as shown in Table 4.19 about 69% have problems of high cost of feeds, 70% were found to have problems of diseases, cost of drugs and veterinary services while other problems recorded include poor

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housing, low prices of pigs lack of finance, lack of cross breeds and high cost of transportation.

4.8.1. High cost of feeds

Cost of feeds have risen due to increases in the cost of crop production inputs. The cost of "dusa" is as high as ₦4.50 per mudu. The high prices reduce the number of farmers that go into pigs production also serve as a control factor in the number of pigs reared by each farmer. Feeds were also found to be substandard resulting in pigs taking longer periods to reach market size consequently increasing cost of production. Cost of feeds was found to be 32.65% of total cost of production as shown in Table 4.10.

4.8.2. Diseases, cost of drugs and veterinary services

Table 4.19 indicates that 70% of the pig farmers faced problems of diseases, cost of drugs and veterinary services. The common disease was tape worm. Both drugs and the veterinary services were found to be minimal in relation to total cost of production (.89%) though they are not easily available to farmers.

Table 4.19: Problems of pig production in Zango Kataf Local Government Area, Kaduna State.

Problem	No. of Respondents	% of Respondents
High Cost of feed	58	68.82
Diseases, drugs and veterinary services	59	69.94
Poor housing	16	18.82
Low prices	13	3.58
Lack of finance	9	10.58
Lack of Cross breeds	2	2.35
Transportation	5	5.88

*Multiple responses were allowed

Source: Survey Data, 1997

4.8.3 Poor housing

Abour 19% of the farmers (18.82%) were faced with problem of housing. The pig shelter was generally poorly constructed and made of local materials. In this situation of inadequate housing, the pigs suffer lack of protection against rains, cold and excessive heat. This situation resulted in higher disease incidence and increased costs of production.

4.8.4 Lack of finance

Few sampled farmers pointed out lack of finance as one of the problems that affected the pig production finance is needed for the procurement of feeds, building materials, piglets and drugs etc. The availability of readily finance would make it easier for the farmers to concentrate on management of the various resources for better production.

4.8.5 High cost of transportation

Transportation affects agricultural production activities through the movement of inputs and outputs. The sampled farmers (6%) faced problem of transportation which affected both production and marketing. The problem of transportation is enhanced by poor roads, cultural and religious taboo which hinder some vehicle drivers carrying swine. Transportation has been fixed at =N=100.00 per pig regardless of the distance. The implication is that farmers may suffer loss as they may not be able to sell their output in place and time as needed. Consequently, it affect the willingness to produce and market.

4.8.6 Lack of improved breed

About two percent of the sampled farmers pointed out the need for improved breeds of pigs as they grow at

faster rate and have advantages over the local breeds. However, it was found that improved breeds were seldom reared by the farmers as government agencies which are supposed to breed and distribute to farmers no longer play this unique role.

4.8.7 Low prices

Sampled farmers (3.55%) faced problem of low prices. This results in farmers receiving low returns per pig reared. This problem is related to the influence of swine middlemen in the swine market who strive, to reduce the amount the producer received as well as increase consumer prices.

Another reason for the prices is the issues of pork being a taboo to some culture and religion there by reducing demand on the products despite the efforts to produce more.

4.9 Problems of Pig Marketing

The following problems were identified:

4.9.1 Lack of shades

As shown in Table 4.20 40% of the marketers pointed to the lack of shade as a factor that limit the progress of marketing activities. Both the farmers, marketers and their products are exposed to sunshine and dust during

the dry season, rainfall and muddy environment during the rainy periods. In the three markets covered by this study, the buying and selling activities were found to operate under the shade of trees and in the open.

4.9.2 Lack of modern abbatoirs and equipment

Lack of modern abattoirs, storage and processing equipment was another problem faced by marketers. The implication is that it causes butchers time to slaughter and process each pig. The availability of such facilities would result in improved marketing activities. Lack of storage facilities force the processors to sell cheaply the already slaughtered animals when demand is low as pork get spoiled quickly without adequate storage or preservation.

4.9.3 High transportation cost

Transportation cost which influence effective marketing was found to be a problem among the markets. Poor roads, increase in fuel prices and the dirty nature of pigs contributed to the high cost reported by the marketers.

4.9.4 Mistrust and cheating

Only 10% of the traders interviewed identified mistrust among marketers as one of the problem facing the

marketing sector of the industry. This problem affects the entire buying and selling activities as some traders spend the market days setting disputes. The problems of cheating, theft etc. also hinder potential traders from going into the trade.

4.9.5 Lack of finance

Just as the producers, the marketers also need money for smooth running of the trading business and the results indicated that 3.33% of marketers need finance to continue the marketing

Table 4.20: Problem of pig marketers in Zango Kataf Local Government Area.

Problem	No of Respondent*	% of Respondent
Lack of shade	12	40.00
High cost transportation	10	33.33
Lack of abattoir and equipment	12	40.00
Fluctuation of prices	12	40.00
Lack of financ	1	3.33
Mistrust and cheating	3	10.00

*Multiple responses were allowed

Source: Survey Data, 1997

4.9.6 Fluctuation of prices

Price fluctuations in the market was reported by 40% of the traders. The highest prices are recorded within the months of May - August and the lowest prices observed in the months of January - April from 1994 - 1996 as indicated in Figure 4.2.

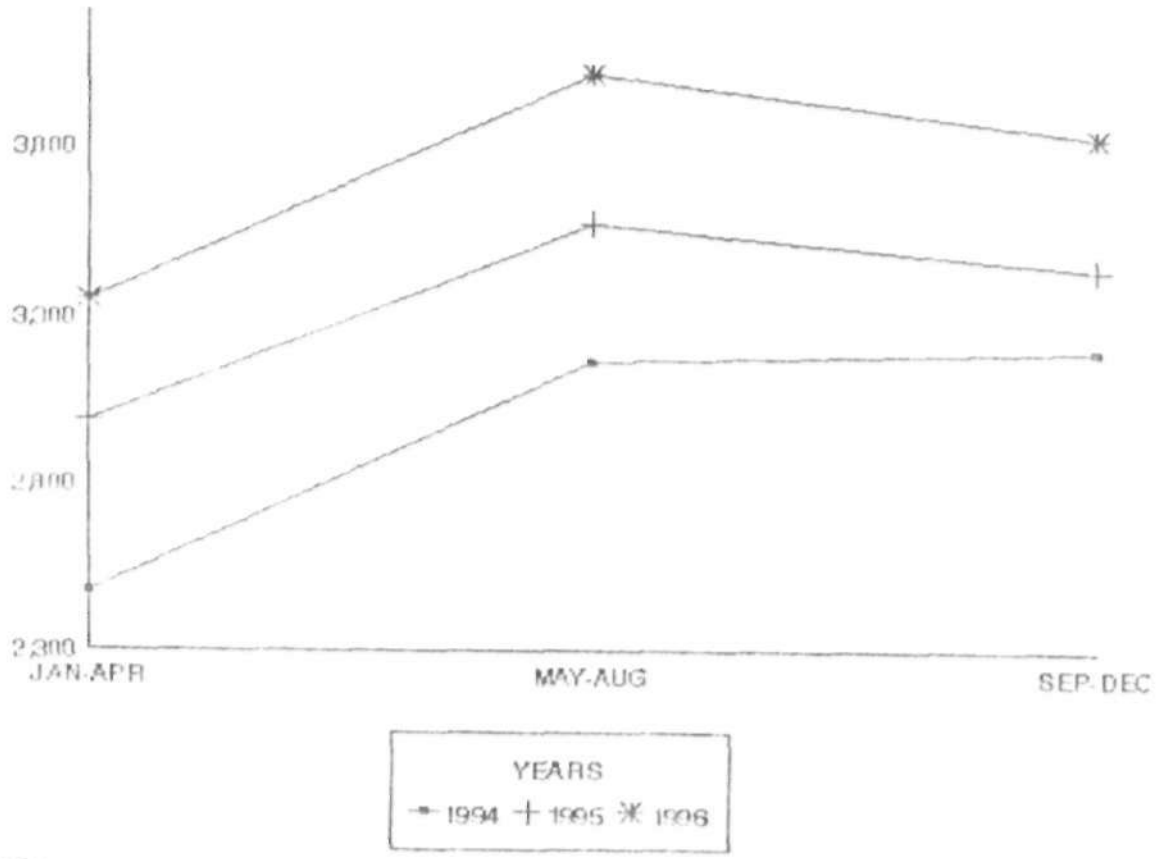


Fig 4.2 Fluctuation of pig prices (1994-1996)

CHAPTER 5

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Findings

1. The socio-economic characteristics of farmers revealed that 37% of pig farmers were within the age of 41 to 50 years. The result shows that age does not affect production of pigs.
2. About 39% of the respondents have between 1 to 5 members per household while 45% have between 6 and 10 persons. It was discovered that male adults, female adult and children up to the age of production engage in pig production activities which are principally feeding and cleaning of pens. However, children scored the least in labour utilization.
3. The mean herd size of the respondents was 3.5 pigs with standard deviation of 1.6. The result indicates that all the respondents are small farmers considering their farm size. It was noted that herd size situation is closely related to the initial capital outlay, availability and ability to pay for feeds and drugs.

. Overall educational level of the respondents showed that a large number of the pig farmers could read in Hausa or English language. Production of pigs however is undertaken by illiterate and literate farmers and education was not found to influence the herd size. Farmers were found to have other sources of income beside swine production. Such occupation include crop production, petty trading and civil service. The bulk of the farmers (88% of the sampled population) depended mainly on farming while 6% in both cases were civil servants and traders who also engaged in part-time crop production. There are other economic activities which assisted the farmers in funding their swine production.

5. Two major sources of land ownership identified in the study area were inheritance (88%) and leasing (12%). The land for pig production is always small and linked to the home as pigs are being reared domestically. The average size of land devoted for swine production was 0.108 hectares.

6. Open market and personal farms were found to be the principal sources of feed and piglets. The results showed that government agencies no longer serve as source of piglets and feeds to the farmers. The major role played by government agencies was in the

provision of veterinary services and drugs. Farmers employed poor genetic breed and low quality feeds.

7. All the respondents indicated that they needed money to accomplishing one operation or the other. About 93% of the sampled farmers source their finance for pig production from their personal savings. Credit either from bank or rural money lenders are insignificant sources of financing pig production.
8. The average net farm income of the sampled farmers was ₦1185.65 per annum.
9. The pig market was found to be competitive. There are many buyers and many sellers. Entry into production and marketing of pigs was easy. The market was found to be vertically integrated as various participants played some other roles besides their principal roles. Flow of information as related to the industry was free and widespread between both farmers, marketers and market officials. The Gini coefficient indicated that there was some moderate degree of concentration in the market.
10. Price determination was by negotiation. It was found that values of pigs and products were not fixed. The ability to make a good purchase depends

on the experience of the purchasers, feeling, observation and the quantity of flesh that the animal has since there were no scale measurement. The observed average price per adult pig was ₦3102.4 and that of piglet was (₦915).

11. Empirical finding indicated that producer's share of what the final consumer paid was high (78.25%). The average marketing margin was 21.75%. The wholesalers had higher market margin than the retailers because of the risk and high cost they incurred. The margin at Katsit (27.22%) was higher than that at both Zonkwa (18.34%) and Samaru Kataf (19.70%). Katsit market was more efficient than both Zonkwa and Samaru Kataf. Pig marketing is therefore, both efficient and profitable as shown by the market margin and efficiency.

12. The major problems in pig production were found to be (a) the high cost of feeds, (b) diseases,(c) drugs and veterinary services problems, (d) poor housing, (e) low product prices, (f) lack of finance, (g) lack of cross - breeds and (h) high transportation cost. Problems of pig marketing are also highlighted as follows: Lack of shades, high cost of transportation, lack of abattoir and equipment, fluctuation of prices, lack of finance,

mistrust and cheating among members and finally lack of weighing facilities.

5.2 Conclusion and Recommendations

This study revealed that pig production and marketing in the study area were profitable ventures. The level of the profitability measured by the farm income was , (N1185.65). This income figure may appear low but the families keep their animals for security reasons to meet emergencies. The market margin was fair, although production cost was found to be high. It should be noted that figures used in the analysis were very conservative, some farmers actually produced higher than the information provided and some might have inflated their production figures. To achieve desired need of more animal protein through pig production and marketing in the country, various problems identified in this study may be minimized by executing the following recommendations:

1. The State Ministry of Agriculture and its agencies should revive the breeding of improved breeds which are more prolific. The present situation where the farmers are left to depend on poor genetic piglets and other inputs should be seriously considered.
2. Both farmers and marketers need to be assisted financially and the state government is called upon

as a matter of urgency to create an agency that can give funds to both farmers and marketers since it is common problem to both of them. Farmers should also be encouraged to form cooperate units with the aim of generating finance for sustainable pig production and marketing as they indicated the need of finance for increase production.

3. Shades and storage facilities such as cold stores should be provided in each of the markets so as to improve the conditions under which people buy and sell pigs. In this situation the Local Government in conjunction with market unions should both contribute towards erecting permanent structures in the markets.
4. The State Government should purchase, install and monitor weighing scales so that pricing particularly at the market sites should be revolutionalised to use standard measurement.
5. The improved feeds including concentrates should be made available to farmers at affordable prices. Agricultural extension workers should also train farmers on how to formulate locally improved feeds for better production.

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