

## ROLES AND EFFICIENCY OF PARTICIPANTS IN PIG MARKETING IN THE NORTHERN PART OF NIGERIA

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### ABSTRACT

This study examines the performance of market participants in pig marketing in Zango-Kataf Local Government Area of Kaduna State, Nigeria. The purpose of the study was to describe the organizational pattern of pig marketing; identify the major problems militating against the marketing efficiency and evaluate the marketing margins of pig at various levels of the marketing channel/chain. The study investigated the pig marketing practices in this area through interviews with producers, rural assemblers, wholesalers, commission agents and retailers. The data collected were analyzed using costs and marketing margins to assess market performance. Empirical findings indicated that the difference (margin) between the price received by producers and the retail price of pork and butchers' sales of by-products was ₦4,192.40 (US \$32.75) per head of pigs. This margin expressed as percentage of the sum of the price paid by pork consumers and by-products merchants was 22% and was shared by the intermediate agents in the marketing chain. Several factors perceived by participants in the market as limiting constraints to pig production and marketing are inadequate abattoir, absence of refrigerators, absence of standard weights and measures, high cost of transportation, lack of access to formal credit sources and lack of good roads. The study recommends the provision of credit facilities, installation of processing plants, use of weights and infrastructural developments in order to increase overall volume of the market.

**Key words:** Pigs, marketing, livestock pricing, intermediaries, efficiency of marketing.

## INTRODUCTION

Specific ways in which efficient marketing systems play a leading role in economic development have been widely documented [12,19]. Essentially, it is within marketing systems that prices are generated and the allocation of resources, income distribution and capital accumulation are determined. It is therefore of great importance for research workers in developing countries to provide adequate information on the efficiency and constraints of the marketing systems on which effective policies and strategies can be based.

Pig marketing in Nigeria is entirely in the hands of traditional middlemen. Government involvement is limited to the areas of disease surveillance, some information gathering and provision of public market infrastructures in a few major towns, with no direct participation or regulatory measures. Hence the Nigerian pig marketing system is essentially indigenous, with strong cultural control.

John Mellor [15], noted that indigenous marketing systems in developing countries are generally exploitative, collusive and economically inefficient. The extent to which this assertion is true for pig marketing in Nigeria is uncertain, for the state of knowledge on livestock marketing largely comes from studies on cattle [18,9], small ruminants – sheep and goats [1,7,21] and poultry [4,17]. There is dearth of literature on pig marketing. Studies by Ajala and Sanni [2,3] constitute the only descriptive and narrative studies on pig marketing. Little is known about marketing functions, presence or absence of opportunities and incentives to market participants/agents to behave in a more market-oriented fashion. This rare (scarce) information is essential for objective and reliable assessments of market performance and the subsequent formulation of policy guidelines.

## JUSTIFICATION FOR THE STUDY

Livestock marketing entails the performance of all business activities involved in the flow of livestock, livestock products and related services from the point of initial production to the consumer. Thus livestock marketing is a business venture consisting of many activities which involve the movement of physical goods and services from the producer to the consumer. Because of the nature of the products (mainly live animals), there are specialized manpower and infrastructural requirements needed for assemblage, bulk-breaking and final retailing of livestock parts and products to consumers in the most conducive state. Furthermore, marketing requires special attention also because of the perceived dispersed nature of demand and supply centres. This widely spatial coverage in

marketing activities entails attention to transportation, the form of the market channel and the number of the links in the chain. This has implications for the pricing mechanism and thus market efficiency.

The need to put in place an efficient livestock marketing system in Nigeria is underscored by the fact that livestock products are seen as exorbitant to the average Nigerian. This however impacts on productivity due to the important place of protein intakes in individuals nutritional requirements. Thus, the products and services in this sector need to be monitored in a way such that there is an added income incentive to its producers, employer of services for participants on the market chain and a regular and available source of the much needed livestock protein at affordable prices for the average Nigerian.

To this end, valuable information can come from case studies of the systems serving the urban centres. This study has focused on pig markets in Zango-Kataf Local Government Area of Kaduna State, to analyze the pig and pork market situation via the following objectives:

- (1) to describe the pig marketing channel and the organization of participants in the marketing system of the study area;
- (2) to describe the socio-economic characteristics of the market participants;
- (3) to identify services provided by different participants in the pig and pork marketing chain and their respective constraints;
- (4) to estimate costs associated with these services as well as distributive margins; and
- (5) to suggest guidelines for future research to improve the marketing system.

## MATERIALS AND METHODS

### The Study Area

The study was conducted in Zango-Kataf Local Government Area of Kaduna State, which is one of the states in the Northwest agro-ecological zone of Nigeria (Figure 1). The location was specifically chosen for several reasons. Firstly, the region is known for its high pig production in Nigeria [3]. Out of the total of 2,368 farm families identified in Zango-Kataf LGA, 1804, representing 76%, rear pigs [11] and secondly, the area is a potential pig market in the country [2]. The marketing system for pig is well-developed in the area. Within the area are several markets which may fall into any of these market categories; primary/collection markets; secondary/regrouping markets and terminal market. Within these markets, there are many actors (farmers,

traders, assemblers and brokers) who are involved in performing different types of marketing functions or roles along the marketing chain.

**Sampling Technique and Size**

Three pig markets were chosen in the study area. The Katsit-Kafanchan weekly pig market is an urban/terminal market and is the largest of its kind in Nigeria. The market is located in Aduwan and Katsit on the outskirts of Kafanchan town. The market serves the surrounding towns of Kwoi, Manchok, Kagoro, Zonkwa and Kachia in the southern part of Kaduna State. This market has remained an important pig market centre since the Colonial days. Two rural assembly markets located at Zonkwa and Samaru-Kataf were also parts of the

markets studied. Thus one urban/terminal market (Katsit-Kafanchan) and two rural/primary markets (Zonkwa and Samaru-Kataf) were selected based on their relevance in terms of pig production and marketing. Through market visits on market days (Katsit – Thursday; Zonkwa – Saturdays and Samaru-Kataf – Tuesdays), the market participants were identified and using different interview schedules, they were interviewed between November 2004 and May 2005. Questionnaires were employed for investigating the sources/ origins and outlets of pigs owned by respondents. The respondents consisted of 25 producers, 10 village dealers (assemblers), 5 wholesalers, 10 retailers (butchers) and 5 commission agents.

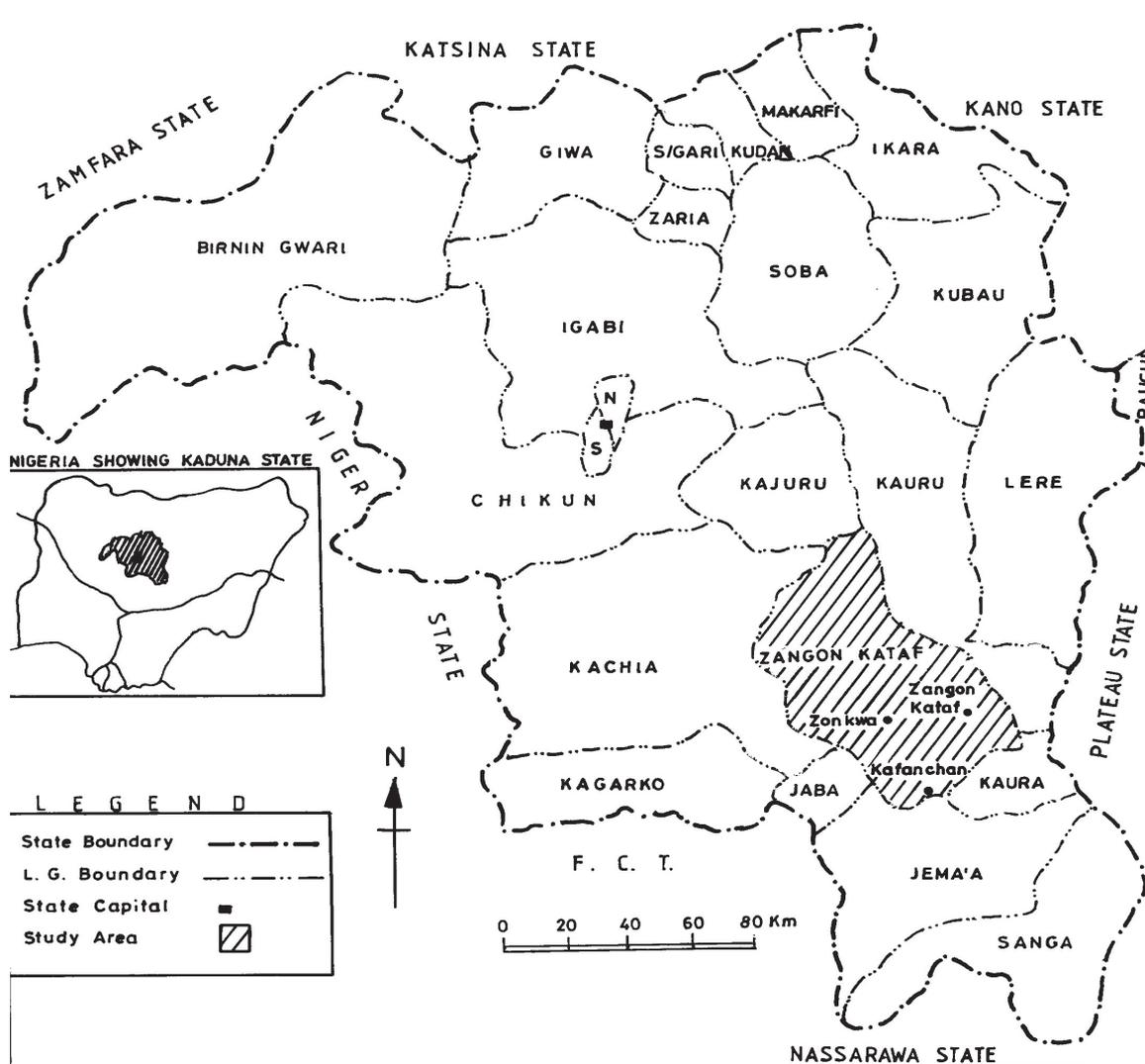


Figure 1: Map of Nigeria showing the location of the study.



Plate 1: The Katsit-Kafanchan pig market in Zango-Kataf Local Government Area, Kaduna State, Nigeria.

Activities in the markets were observed from morning till afternoon (9.00 – 16.00 hrs) on relevant days. All market participants – buyers, sellers, intermediaries (agents and brokers) were all interviewed to establish the nature and extent of their involvement. Producers and intermediary agents were asked the estimated selling price of animals, the costs for marketing their livestock and the problems they face in the marketing process. Price bargaining was closely monitored in each case; when an agreeable price was reached, this was recorded.

Pig producers were reluctant to allow actual weighing of their animals, so actual live weights of pigs could not be incorporated into the study.

#### Data Collection

Regular market surveys on a weekly basis commenced on November 2004 and ended in May 2005. In addition to market (transaction) surveys, traders were also surveyed. Market data collected include information on flow of pigs, sources of origin, number and prices of pigs traded, modes and costs of transportation, arbitrage functions performed by different marketing agents, access to credit, payment of taxes, levies, etc.

For livestock transactions in particular, data were collected on number of pigs sold, price at the point of origin, price at market, purpose of purchase (e.g. resale, slaughter, fattening), type of seller (e.g. farmer, trader, breeder) and type of buyer (farmer, trader, restaurateur, butcher).

#### Theoretical and Conceptual Framework to Market Study

The performance of a market is influenced by two major factors: (i) the structural characteristics of the market, and (ii) the competitive behaviour of actors/participants in the markets chain. Understanding how these factors work independently and together can provide a basis for identifying opportunities to be exploited and constraints that need to be removed. Market study involving analysis of competition and efficiency is useful for the formulation of interventions, particularly those aimed at lowering marketing costs and reducing the tendency for excessive profit making.

The study of markets and marketing has witnessed a lot of paradigm shifts. Theoretical and applied models of market analysis such as the Structure, Conduct and Performance (S.C.P.) paradigm [5], the Commodity Chain Approach [23,24] and Transactions Costs Economics (TCE) Approach [16,28] have been proposed. The existence of a wide range of models suggests that there is hardly any single and adequate theoretical framework for studying markets, particularly in developing countries. Any of these approaches can be used singly or combined. The choice of any or combination of the approaches is usually guided by considerations such as the nature of the problem, complexity of the marketing systems and the constraints involved. Hence, in studying livestock markets, there is a need to marry useful elements of both the old and the contemporary models together in order to understand the structural and institutional factors influencing livestock marketing. Thus, it was the aim of

this study to briefly examine the major elements of some of the approaches and their applicability or relevance to the study area.

### **The Structure-Conduct-Performance (SCP) Approach**

A large number of agricultural marketing studies rely on the theoretical foundations laid by the “perfect competition” model. This is particularly true in studies based on the structure-conduct-performance paradigm. The SCP paradigm originated from the work of Bain [5]. The structure components (variables) of a market include marketing channels, marketed volumes, degree of market information, the ease of entry and exit of buyers and sellers into and out of the market. Market conduct refers to the actions which market participants take out of their own discretion or patterns of behaviour which they follow in adopting or adjusting to the market in which they buy and sell. The conduct components (variables) of a market include exchange functions, methods of determining price (price determination) and product differentiation. Hence market conduct refers to the various strategies adopted by participants in buying, selling and pricing. The SCP approach postulates that as market structure deviates from the paradigm of a perfect competition, the degree of competitive conduct will decline and there will be a consequent decrease in output (supply) and allocative efficiency, and an increase in prices. This implies that the performance of markets can be assessed based on the level of competition and efficiency in those markets [28]. Structure and conduct can be assessed indirectly. This study attempts to distinguish marketing channels spatially (and also stratify traders according to their scale of operations) and also identifies traders/participants roles and functions in the marketing chain in order to measure the structure and conduct of the market. The fact that traders’ scale of operation (small, medium and large) differ, makes generalizations and speculations about traders conduct (behaviour) and market structure difficult to predict. Hence grouping traders according to their economic and social differences is expected to give a better understanding of how markets function, because participants in livestock trade operate at different scales. The existence of these strata implies that a certain degree of price collusion could go on within and between strata which in turn may affect entry conditions and thus result in changes in market structure [28].

The SCP framework has been criticized for being too abstract and deterministic. The theory has been criticized on the following grounds:

- its price integration and price performance analyses are static and suffers from spatial arbitrariness [10].

- its market segmentation concepts with respect to margins and transfer costs are faulty [6].
- it does not explain how competition among traders may affect consumers’ welfare.

Thus the approach fails to explain the causal links between structure, conduct and performance and is therefore unable to predict performance from structures and vice versa [10]. Despite these limitations, the SCP framework still remains the conventional approach for studying market institutions [22].

This study applies the SCP model to examine whether marketing margins charged by various participants in the marketing system are consistent with costs.

### **Commodity Chain Approach**

The commodity chain approach builds on the SCP framework. It assumes vertical as well as horizontal relationships between firms in evaluating market performance and is more dynamic in following the entire commodity flow from producer to the ultimate consumer. At each stage along the commodity chain, the approach permits three types of analysis namely: (i) costs and margins, (ii) spatial flows (involving places, volumes and directions), and (iii) the social relations of trade [13].

### **Transactions Cost Approach**

One of the assumptions for perfect competition in neoclassical economic theory is perfect information under which it is presumed that traders in each market have perfect knowledge of the situations in all other markets and, as such, inter-market price differentials only reflect transportation and handling costs between concerned markets. Transaction Cost Economics (TCE), unlike neoclassical economic theory, recognizes that commercial activity does not occur in a functionless economic environment [27]. Costs usually incurred include cost of purchase of product and transactions costs, which can be further subdivided into information (ex-ante), negotiation, and, monitoring or enforcement (ex-post) costs [27]. Transactions costs include inter alia, the costs of searching for a partner with whom to exchange, screening potential trading partners to ascertain their trustworthiness, bargaining with potential trading partners (and in some cases officials who can hold up trade) to reach an agreement, transferring the product (typically involving transportation, processing, packaging and security title if necessary), monitoring the agreement to see if conditions are fulfilled, and enforcing (or seeking damages for violation of the exchange agreement) [25].

Against the limitations of the commodity chain approach regarding institutions, it has been argued that institutions are efficient responses to transactions costs in

that institutions emerge due to high assets specificity, high uncertainty, high levels of transactional idiosyncrasy and high levels of opportunism. The transactions costs theory predicts that transactions costs increase with distance, market concentration, systemic complexity and declining clarity of property rights and that transactions costs decline with relational contracts, with standardizing quality and quantity [14].

The smallholder nature of livestock production in Nigeria has implications for increasing marketing cost because more intermediaries are involved between these smallholder producers (who are widely dispersed in space) and the consumers who are located several kilometers away. In addition the volumes of pigs handled by these farmers are small, requiring market agents to move round these farmers to collect the few pigs that are to be sold.

It is expected that if transactions costs are lowered, there would be an increase traded volume with economic benefits to both traders and producers while increased volume of livestock trade will promote regional trade and integration.

In many studies, imperfections in marketing systems, which lead to loss of competitiveness and efficiency, have been attributed to high and sometimes prohibitive transactions costs. Even then there are only a few studies in which detailed empirical evidence is provided on the magnitude and importance of transactions costs [25]. They observed that this may be due to the existence of conceptual and measurement difficulties when transactions costs are high enough to prevent exchange from occurring or due to the differences in the nature of observed transactions costs. For example, a farmer's decision to sell at the farm gate rather than at a more distant market may be influenced by the desire to avoid transactions costs involved in the later option. On the other hand, the same farmer may decide to go all the way to a distant market because of excessive profits made by intermediary traders – a situation, which lowers return to producers.

It is desirable that observed marketing margins are commensurate with marketing services provided or marketing functions performed, getting a product such as an animal from its producers (a smallholder) to the final consumer requires more individual transactions due to the small size of each sale relative to what obtains in developed economies where livestock production is done on a large scale [8]. This phenomenon increases transactions costs and, consequently, increases the amount paid by the final consumers (sales price).

This study used costs and marketing margins to assess market performance (that is, intermediary trader's

performance).

## RESULTS AND DISCUSSION

### The Pig Marketing Channel

Most of the traded pigs brought to the markets are from pig farmers living in Ungwa-Rimi, Kafanchan, and the surrounding villages. At village levels, itinerant traders visit the homes of pig farmers to buy pigs in small numbers such as one or two. They are then sold at local village markets to intermediate traders who are assemblers with more funds and capacities for bulking larger numbers. These intermediate traders visit similar smaller markets, such as Zonkwa and Samaru markets, and gradually build up a herd for sale in the Katsit (urban) market. Ownership of pigs may in some cases change hands two or three times before reaching Katsit (with each new owner taking a small mark up in price), while in other cases it may be direct supply from buyers at the village to the Katsit (Kafanchan) market.

Traders themselves rarely own vehicles for transportation; they use the services of other transporters. For distances between the farmers' homesteads and the immediate local village market, animals are trekked. Transportation of pigs to subsequent markets is usually by trucks of varying sizes and capacities depending on distance and number of animals involved. In some cases pigs are trekked from neighbouring villages directly to the markets. Two principal buyers in the Katsit market are wholesale traders who take animals to the south and the local butchers (retailers) who slaughter for fresh pork sales in open markets both in Katsit and in the neighbouring villages of Zonkwa and Samaru-Kataf. In addition to these, some traders buy for resale either immediately or after some minor fattening operations. Direct purchases by some hoteliers/ restauranters for slaughtering also occur. Some pork consumers purchase pigs cooperatively for slaughter and distribute among the group members.

The pig marketing channel in the study area (Figure 2) follows a centralized pattern in which the producer's pigs are brought together in larger central and terminal markets. There, they are purchased by the wholesalers or retailers from commission agents and brokers who act as the producer's selling agents. The marketing chain for pigs in the study area is a long chain in that pigs pass through many market participants (intermediaries) or succession of markets before reaching the final consumers. The longer the chain the higher the price the consumer will have to pay.

The major actors in the channeling of pig in the study area therefore include the assemblers, the

wholesalers, the retailers and the producers. Field data collected delved into the most prominent of these market channel actors. To this end, producers were requested to indicate the major buyer of their animals. A large proportion of the producers opined that they prefer selling their animals to assemblers. The main reasons adduced is that of quick and guaranteed payment for their animals, the reduction of risks associated with transportation and the reduction of costs associated with the performance of marketing functions that could well be efficiently undertaken by assemblers. The assemblers sell to the rural wholesalers and the commission agents. These two set of intermediaries sell either to the rural retailers or urban wholesalers. The rural retailers then sell to the rural consumers. The urban wholesalers sell to the urban retailers. Finally, the urban retailers sell to the urban consumers. Figure 2 is a diagrammatic representation of the channels of pig movement in the study area showing the number of market actors in the chain.

In terms of number, there are many of each of the above

categories of middlemen operating in the markets. A limiting factor to the number of animals a middleman is able to buy at any given time is the amount of operating capital available to him.

Private entrepreneurs ranging from small itinerant traders to wholesalers operate the pig marketing channel described in Figure 2. Other major participants are producers, traders' agents and intermediaries (brokers). The major role of pig producers is as suppliers/ sellers, although they occasionally purchase pigs for breeding and fattening. Brokers (intermediaries) and butchers (retailers) are seen as part of the market participants.

**Livestock Flows in the Marketing Channel**

Although producers are expected to take animals to the market for sale, there was no known regulation compelling them to sell or buy from particular markets (e.g. farm gate or collection market) or through particular agents (e.g. the small itinerant trader or assemblers). Thus the volume of animal flow through the channel reflected efforts by producers to sell their animals through

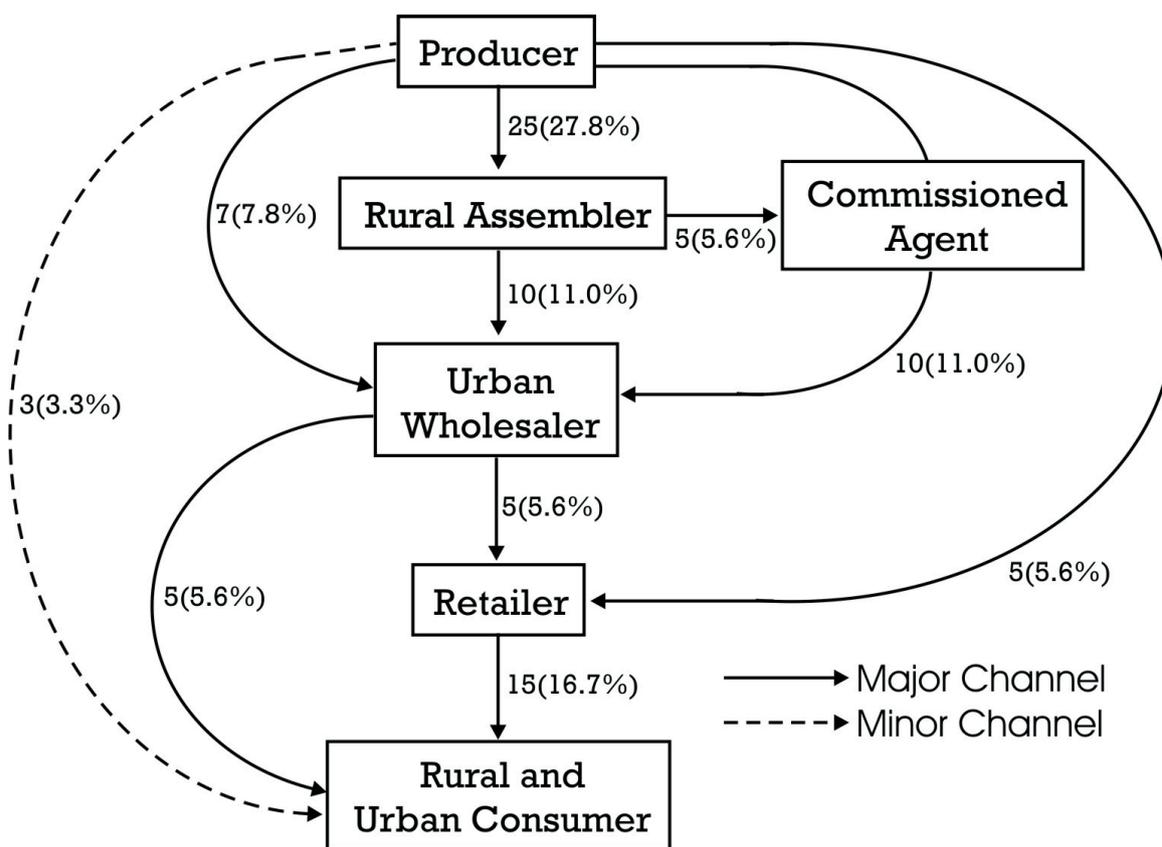


Figure 2: Marketing channel for pig in Zango-Kataf LGA, Kaduna State, Nigeria showing the number of respondents in the flow. Source: Fieldwork, 2005.

channels that provided more profit and also traders strive to buy through channels where they had a higher chance of making more profit.

Out of the 8,623 pig transactions recorded in Katsit-Kafanchan market during the study period, 258 (3%) were purchased by traders directly from the farm gate while 7,813 (90.6%) passed through primary/ collection markets (Figure 3). From the point of view of the relative contributions of the various sources to the 8,623 pigs from the farm gate, it was calculated that 3% (258 pigs) were purchased directly from farm gate, 86.5% (7,489 pigs) entered the tertiary/consumption market from the secondary/regrouping market, while 10.5% (876 pigs) were butchered at the secondary/regrouping markets. It is clearly shown that traders operating in Katsit market bought most of their pigs from the rural assemblers and other agents.

From the point of view of the relative contributions of various sources to the 7,747 pigs that entered the tertiary/consumption market, it was calculated that 258 (3%) were directly from the farm gate, while 7,489 (86.5%) came directly from secondary/regrouping market. Collectors played a prominent role in the marketing channel, about 7,813 (90.6%) of the pigs passed through the collection markets, and even at the secondary or regrouping markets, collectors remained active and purchased 6,333 (80.9%) of the pigs that reached there, with the sole aim of reselling them in the same market for a profit.

The high level of involvement of collectors in the marketing system of pigs in the study area is not unconnected with the fact that most traders at the primary market are indigenes who know and understand both the terrain and the local languages well.

It is clear that the major value-added activity was the transfer of pigs from one location or market to the other as the trade is based on live animals.

### **Socio-economic Characteristics of Market Participants**

#### *Profiles of market participants operating the pig marketing channel*

Operators of the pig marketing channel described in Figure 2 range from small itinerant traders to large scale traders (wholesalers). Other participants are pig farmers (producers), traders' agents (assemblers), commission agents and brokers (intermediaries). The major role of pig producers is as suppliers/sellers, although they occasionally purchase pigs for breeding and fattening. During the survey, 90 market participants were interviewed as follows: 40 traders, 15 assemblers, 10 commission agents, 10 wholesalers and 15 retailers

(butchers).

The participants' socio-economic characteristics are presented in Table 1. The table shows that 54.3 per cent of the participants did not have formal education, with this figure ranging from 30 per cent among the wholesalers to 73.3 per cent among the retailers. The table shows on the average 45.7 per cent of the respondents had formal education with 27.2 per cent, 15.5 per cent and 3 per cent of the respondents attaining primary, secondary and tertiary education respectively. The most educated respondents were found among the wholesalers and the producers where some of them even completed tertiary education.

About 44 per cent of the respondents have been operating for more than 10 years. In the market, 60 per cent of the wholesalers had more than 10 years experience in the business while 30 per cent of the commission agents had more than 10 years experience. Pig trading involves a lot of capital hence some of the respondents had to initially act as agents for others (assisting them in buying and transferring pigs from other markets) as brokers in the same market or entering into partnerships with others in order to participate in the trade. Table 1 also revealed that 37.8 per cent of the current market participants initially acted as brokers while 36 per cent were agents for other traders. It could be surmised that successful participation in pig trade requires not just the financial capital but also a period of apprenticeship that could last for years. Although operating capital may not pose a serious monetary barrier to intending entrants into the pig trade, but integrity, honesty, experience (in pricing animals) and confidentiality which could only be acquired through apprenticeship.

At the farm gate, payment for all purchases was usually made in cash at the time of purchase. At times traders sell on credit to customers they consider to be credit worthy. At times pig merchants give credit to producers in order to gain steady supply of animals from the producers. The credit is paid back through supply of pigs to the merchants. Throughout the rung of the marketing channel, the pattern for payment of animals is usually through a combination of cash and credit. This is probably because the amount of capital required for active participation by the various categories of participants in the trade (to make direct purchases) is usually enormous and limiting for many of them. The enormous operating capital required could be the reason why some participants have to initially operate as agents and others as brokers or in partnership with other traders (participants) in order to enable them build enough capital to participate in the trade. A cursory look at Table 1 revealed that 63 per cent of the participants indicated that

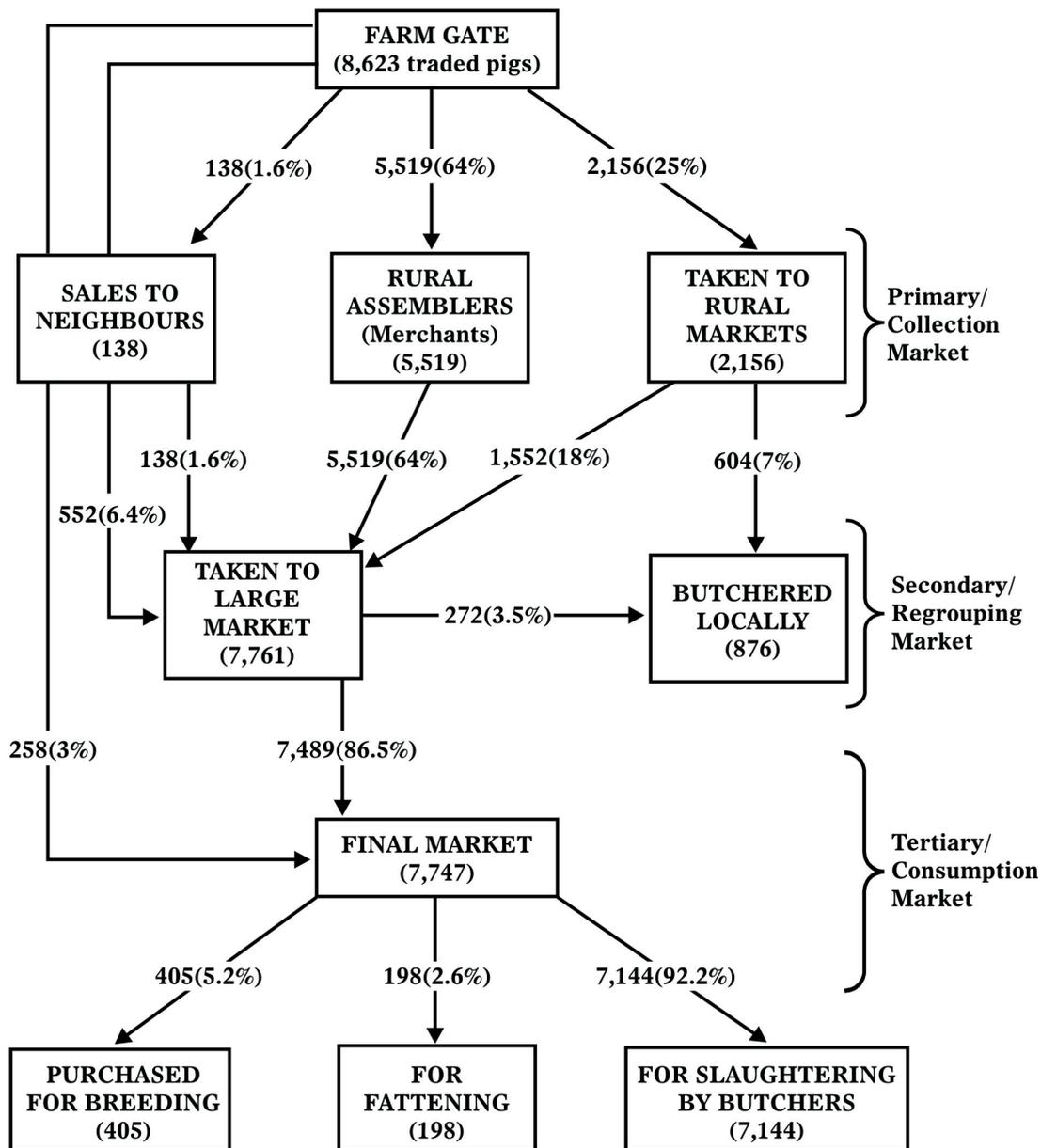


Figure 3: Livestock market structure and volume of flows of pigs into Katsit-Kafanchan terminal market. Source: Fieldwork, 2005.

The percentages shown in figure 3 have been calculated to add to 100 percent from each box, for example for figure 3, the 7,747 traded pigs that reached the terminal market were made up of 5.2% for breeding, 2.6% for fattening and 92.2% slaughtered for consumption.

they were using their own capital and 94 per cent were not in partnership with others. The low level of incidence of partnership may be due to the fear of losing money and conflicts with partners. There was clear indication during the interviews that some participants (e.g. assemblers and commission agents) wish to change status to wholesale merchants. Participants indicated that changing status in the marketing systems of pigs is largely influenced by size of operating capital. Pig trading involves a lot of capital and as a result some of the traders had to initially act as agents for others.

#### **Exchange Functions and Price Determination**

Two different sale agreements were noted between buyers and sellers depending on the existing relationship between the parties. While most of the traders sampled (68%) generally sold on the basis of cash and carry condition, some sold on credit. Most of the traders that sold on credit had regular buyers. Sales on the market are through the usual haggling over prices without weighing the animals or any other standardization. Therefore, the price the traders charge is arbitrary and subjective, higgling and haggling is the usual procedure for pricing. Product differentiation was in the form of visual assessment of animal size, health and condition score.

**These findings conform to a report on a study of goat marketing in Zaria, Kaduna State, Nigeria where the price of goats depends on different groups of factors, such as sex, visual appraisal of size and age (Aduku et al., 1991). Analysis revealed that another group of factors found to affect pig prices were seasonality and festivals. Pig prices are generally expensive in the dry season when Fulani herdsmen have moved to the wet areas of the south, and are away from the north. This creates partial scarcity of cattle leading to higher prices of pig and pork. When the Fulani herdsmen return to the northern part of the country at the beginning of the rainy season, prices of cattle and goat fall due to excess supply. Prices are lowest between January and March.**

*In the months of November, December and April, pig prices are high as these months correspond to the festive periods of Christmas and Easter respectively. This suggests that marketing of pig in the study area is still largely determined by factors which at best of times, would tend to encourage pricing inefficiency. Hence key factors in pig pricing can be readily manipulated by market participants especially sellers. During pricing, other buyers and sellers could contribute in the estimation in order to arrive at acceptable prices for sellers and buyers.*

Investigations on whether traders collude on

price or number of animals to be sold were largely in the negative. Only 28.9% admitted discussing animal prices with co-traders and 76.7% never waited for any particular period of better prices before deciding to bring their animals to market.

For speculative marketing, 10% of the respondents bought and sold some animals in the same market. Hence collusion and speculative marketing are not serious problems in the study area even though they are present. However, the absence of standardization and poor pricing allow a situation where pig prices do not reflect the source prices. This can lead to higher gross margins to traders than under competitive conditions. Also, considerable time is wasted during price negotiations. All these culminate in marketing inefficiency.

The relative importance of various means of transportation was also investigated and the results summarized in Table 2. No rail transportation was observed. Transportation by trucks was virtually the major means of moving pig despite its much high cost (₦233 or \$1.82 per animal) when compared with hoof transportation (₦76 or \$0.59), indicating that the opportunity cost of hoof transportation, probably in terms of time, weight loss and risk, is higher than trucking. The choice of transportation can be influenced by the distance from the origin to the market. Transportation cost which influence effective marketing was found to be a problem among the traders. Poor roads and incessant increase in fuel prices contributed to the high cost reported by the traders. Certainly, with an improved road system, the rates of turnover will be far higher for truck transportation than for hoof (Table 2).

#### **Services, Costs and Constraints Faced by Market Agents**

Marketing of pigs and pork involves many agents and it is difficult to be precise about their exact number and their role in the marketing process which can often be multiple. Live animals may pass from the producers to rural assemblers, then to wholesalers and commission agents at intermediary or terminal markets. Furthermore, butchers, consumers and other merchants in the terminal market constitute the rest of the market chain where pork is consumed and by-products are further processed or distributed.

#### **Producers**

Pig producers in southern Kaduna area (the study area) are widely dispersed and have almost no coordination among themselves. They mostly dispose of their pigs at the village level because they have no transport to take them to larger markets located 15 to 53 km away; this also avoids difficulties of transporting them to town

Table 1: Characteristics of market participants operating the marketing channel in Zango-Kataf LGA of Kaduna State, Nigeria.

Characteristics	Producers (n=40)	Assemblers (n=15)	Commission agents (n=10)	Wholesalers (n=10)	Retailers (n=15)	Average
<b>Educational Level</b>						
No formal education	22(55.00)	8(53.33)	6(60.00)	3(30.00)	11(73.33)	10.0(54.33)
Primary education	9(22.50)	4(26.67)	4(40.00)	2(20.00)	4(26.67)	4.6(27.17)
Secondary education	7(17.50)	3(20.00)	0( 0 )	4(40.00)	0( 0 )	2.8(15.50)
Tertiary education	2( 5.00)	0( 0 )	0( 0 )	1(10.00)	0( 0 )	0.6( 3.00)
<b>Experience in pig trade</b>						
1 – 3 years	5(12.50)	2(13.33)	2(20.00)	1(10.00)	0( 0 )	2.0(11.17)
4 – 6 years	8(20.00)	3(20.00)	3(30.00)	1(10.00)	3(20.00)	3.6(20.00)
7 – 9 years	12(30.00)	4(26.67)	2(20.00)	2(20.00)	4(26.67)	4.8(24.67)
>10 years	15(37.50)	6(40.00)	3(30.00)	6(60.00)	8(53.33)	7.6(44.16)
<b>Original part played in market before now</b>						
Trader	35(87.50)	2(13.33)	1(10.00)	0( 0 )	3(20.00)	8.2(36.17)
Agent	0( 0 )	5(33.33)	2(20.00)	8(80.00)	7(46.67)	4.4(36.00)
Broker	5(12.50)	8(53.33)	7(70.00)	2(20.00)	5(33.33)	5.4(37.83)
<b>Sources of initial operating capital</b>						
Own	35(87.50)	2(13.33)	3(30.00)	6(60.00)	10(66.67)	11.2(51.50)
Borrowed	2( 5.00)	10(66.67)	2(20.00)	0( 0 )	1( 6.66)	3(19.67)
Own and borrowed	3( 7.50)	3(20.00)	5(50.00)	4(40.00)	4(26.67)	3.8(28.83)
<b>Source of operating capital now</b>						
Own	37(92.50)	2(13.33)	3(30.00)	10(100)	12(80.00)	12.8(63.17)
Borrowed	0( 0 )	6(40.00)	0( 0 )	0( 0 )	0( 0 )	1.2(8.00)
Own and borrowed	3( 7.50)	7(46.67)	7(70.00)	0( 0 )	3(20.00)	4.0(28.83)
<b>Partnership status at the beginning</b>						
Alone	38(95.00)	10(66.67)	6(60.00)	8(80.00)	10(66.67)	14.4(73.67)
In partnership	2( 5.00)	5(33.33)	4(40.00)	2(20.00)	5(33.33)	3.6(26.33)
<b>Partnership status now</b>						
Alone	40(100.00)	12(80.00)	9(90.00)	10(100.00)	15(100.00)	17.2(94.00)
In partnership	0( 0 )	3(20.00)	1(10.00)	0( 0 )	0( 0 )	0.8(6.00)

Source: Fieldwork, 2005. Figures in parenthesis are percentages.

Table 2: Means of transporting pig to the Katsit/Kafanchan market, Zango-Kataf LGA, 2004-05

Item	Truck	Hoof
Number of traders	68	22
Percentage of traders	75.6	24.4
Number of animals	7,148	1,475
Percentage of animals	82.9	17.1
Average transport cost, including loading and off-loading (Naira/animal)	233	76

Source: Field survey, 2005.

markets. In addition, because they sell small numbers to meet urgent cash demands, the producers are not in a position to bargain very effectively. Some producers transport their animals on hoof to the market where the market is within a trekking distance.

#### Rural Assemblers

Rural assemblers purchase animals from surrounding areas and sell them to wholesalers in urban markets. They pay the animal transportation costs, local tax paid when livestock are brought from the producers, feeding costs and their own food costs. These costs averaged ₦226 ± 2.7 (\$1.77 ± 2.7) per head (Table 3). Transportation of animals is usually by trucks. Transportation costs averaged ₦0.25 per head per kilometer (km) based on distances ranging from 3 km to 20 km. Rural assemblers' sales prices were higher than producers' sales prices. This suggests that producers have less bargaining power than rural assemblers or that as the animals are incorporated into the marketing chain the buyers become more and more selective.

#### Wholesalers and Commission Agents

Wholesalers buy from the rural assemblers in villages and transport the pigs to Katsit (8 km – 30 km), the major market centre in the local government area as well as to other consumption centres outside the study area such as the south and eastern part of Nigeria (860 - 980 km).

Interviewed wholesalers stated that commission agents were an essential link with the buyers (butchers/retailers) because of their role in bargaining and arranging livestock sales. The wholesaler arranges transportation to Katsit, feeds the animals, pays the tax, and absorbs the costs of animal shrinkage during a journey that ranges from 150 to 300 km. These marketing costs total ₦642.9 (\$5.02) per head (see Table 3). In addition an average fee of ₦100

(\$0.78) is paid to the commission agent. Commission agents also pay the social costs of the purchasing process (food/snacks for wholesalers and retailers/butchers); these social costs averaged ₦16.1 (\$0.125) per head.

In Katsit market, there is no facility to provide rest or shelter for the pigs before slaughtering. The slaughter house (abattoir) is very filthy. Grading of carcasses is not practiced. Standards of hygiene are very low and lack of chilling facilities results in the slaughtering of small numbers of pigs that can be sold on a daily basis.

Slaughtering facilities are grossly inadequate. The level of hygiene in the market is very low and inadequate. There is also an inadequate storage facility in the markets. Meat is highly perishable, yet pig markets in the study area lack cooling facilities where unsold products could be stored.

The main difficulty of the market participants is the high cost of the marketing services, for example transportation cost. This problem has been accentuated by increase in the price of petroleum and spare parts of vehicles.

#### Retailers (Butchers)

Retailers are the people who slaughter and dress the live animals converting them into meat thereby creating the form utility needed by the consumers. The retailers sell in convenient units to consumers. Pork is sold fresh and without refrigeration after slaughter. In general, pork is used fresh, but occasionally, meat is cut into small pieces and roasted as *suya* or *tsire*. Marketing costs include transportation and slaughtering. Most of the gross returns to butchers come from meat sales but a substantial portion (17%) is received from by-products such as head, legs and offals.

#### Distributive margins

ROLES AND EFFICIENCY OF PARTICIPANTS IN PIG MARKETING IN THE NORTHERN PART OF NIGERIA

Table 3: Average sale prices of pigs received by producers, marketing costs and profits of rural assemblers, wholesalers, retailers and commission agents in Zango-Kataf LGA of Kaduna State, Nigeria (₦<sup>1</sup> per head)

Cost		Mean	SD
Item	Description		
<b>A.</b>	<b>Livestock Producers</b>		
1.	Sale price	15,210.0	1,092.5
<b>B.</b>	<b>Rural Assemblers</b>		
2.	Marketing costs	226.0	2.7
a.	Transport cost	196.0	-
b.	Loading and off-loading	30.0	-
3.	Sale price	16,132.8	64.2
4.	Margin (item 3 – item 1)	922.8	-
5.	Profit <sup>2</sup> (item 4 – item 2)	696.8	-
<b>C.</b>	<b>Wholesalers</b>		
6.	Marketing costs	642.9	41.2
a.	Transport cost	212.9	
b.	Loading and off-loading	80.0	
c.	Market charges (i.e. security/guard)	50.0	
d.	Feeding costs of animals awaiting sales	100.0	
e.	Tapeworm inspection	50.0	
f.	Local tax	50.0	
g.	Illegal tax (road blocks)	100.0	
7.	Wholesale price <sup>3</sup>	17,574.7	1,005.0
8.	Margin (item 7 – item 3)	1,441.9	-
9.	Profit <sup>3</sup> (item 8 – item 6)	799.0	-
<b>D.</b>	<b>Retailers (Butchers)</b>		
10.	Marketing and processing costs	445.2	9.5
a.	Transport cost	200.2	
b.	Cost of butchering (slaughtering)	245.0	
11.	Retail price (sales of pork and by-products)	19,402.4	54.8
a.	Sales of pork	17,599.4	
b.	Sales of by-products (heads, legs & offals)	1,803.0	17.2
12.	Margin (item 11 – item 7)	1,827.7	
13.	Profit <sup>2</sup> (item 12 – item 10)	1,382.5	
<b>E.</b>	<b>Commission agents<sup>4</sup></b>		
14.	Transaction costs	16.1	2.4
15.	Commission fee charged	100.0	6.2
16.	Profit <sup>2</sup> (item 15 – item 14)	83.9	

Source: Field survey, 2005.

SD = Standard deviation.

<sup>1</sup>₦128 = US \$1.00 (May 2005)

<sup>2</sup>Excluding labour, management and risk cost

<sup>3</sup>Includes an average of ₦100 per head paid to the commission agent.

<sup>4</sup>Commission agents mediate on behalf of wholesalers or retailers (butchers) for the same amount of ₦100 per head, commission fee.

The difference (margin) between the price received by producers and the retail price of pork and butchers' sales of by-products was ₦4,192.40 (US\$32.75) per head of pigs. This margin expressed as percentage of the sum of the price paid by pork consumers and by-products merchants was 22% and was shared by the intermediate agents in the marketing chain. Margins for pigs from Table 3 were averaged and broken down into marketing, transaction, and processing costs as well as profits encountered at different stages in the marketing chain (Fig. 4). In terms of profit per head, the butchers get 2 times, that is double the profit of the rural assemblers and 1.7 times the profit of the wholesalers, and 16.5 times as much as the commission agents. The marketing costs exclude labour, management and risk costs; therefore, the actual profits may be considerably less than shown in Figure 4.

In terms of marketing margin, there is empirical evidence

to prove that the middlemen are not receiving high margins in excess of the value they add to the commodity. Figure 4 shows the marketing margin that goes to various market intermediaries.

Commission agents are often portrayed as taking advantage of other intermediaries or as being responsible for reducing returns to producers. However, commission agents do the bargaining on behalf of wholesalers and retailers (butchers), using personal knowledge of the market forces in Katsit and other markets outside the study area. Since there are no regulations which stipulate that it is obligatory to use commission agents to buy and sell pigs, butchers and wholesalers must be willing to pay commission agents for their information about the supply and demand situation.

Even though there are only a few institutional regulations in the pig and pork market such as veterinary services and provision of public market infrastructures such as

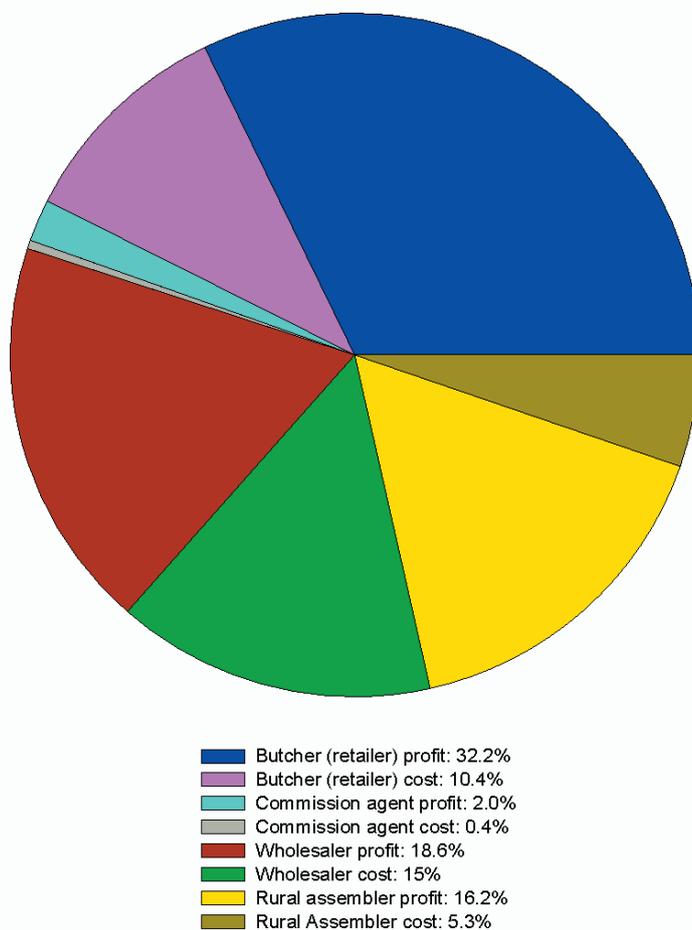


Figure 4: Distributive margins of pigs in Zango-Kataf LGA, Kaduna State, Nigeria.

Source: Field survey, 2005.

slaughter houses, the market system does provide services which are integrated to a relatively high degree.

### Developing the Pig/Pork Industry

Developing the pig/pork industry in Zango-Kataf LGA of Kaduna State, Nigeria will be difficult as long as there is lack of standardization/ grading of animals/ carcass. This does not encourage the improvement of the pigs/pork sold in the market.

Price negotiations, whether at the producers' farm gate, at the markets, or in transit, are on a one-to-one basis (personalized). There are no auctions at markets, but rather numerous individual transactions taking place simultaneously on a willing buyer/willing seller basis.

Although, pig marketing channel in the study area was found to be simple, there were a number of constraints to efficient functioning of the market arising from lack of market information, limited own-capital, and lack of access to formal credit sources, lack of good roads and exorbitant transport fees. These constraints increase actual market and transactions costs.

Provision of credit facilities to enable aspiring traders to overcome market entry limitations posed by lack of own-capital, hence increasing number and volume of trade.

With appropriate price incentives most of the services provided by the market could be improved for the benefit of consumers and producers; the overall volume of the market could be higher, the quality of meat could be more uniform and some marketing costs could be decreased. Also, the on-shelf durability of meat could be improved upon through the installation of processing plants.

It is expected that if these suggestions are considered, it will help to improve the performance of the pig/pork marketing system; consequently consumers will have more value for their money.

### Limitations of the Study

This study is an attempt to understand the roles of market participants in pig marketing in Zango-Kataf LGA of Kaduna State, Nigeria, but it has several limitations. First, market participants (respondents) were reluctant to give correct information on their costs and returns from livestock transactions. Second, there was an almost complete lack of records amongst producers and intermediaries involved in the marketing of pigs. Third, even though Katsit market is a terminal market and the largest in southern Kaduna area, other (intermediate and redistributive) markets from other Local Government Areas were not included in the study. Lastly, the investigations have left out some features of the markets which should have contributed greatly to a study of this

type. This can be attributed to the limitation on the part of resources of time and material available. Outstanding among these features are biological characteristics of the traded pigs, seasonal variations in pig flows and seasonal variations in pig prices. In fact, the very little attention paid to them in this study is more indicative of their importance than their unimportance. It is assumed that these features will no doubt go a long way to call for full-scale investigations. And their omission here would help to hasten investigations on them.

### REFERENCES

- [1]. Aduku, A.O., Aganga, A.A., Yaakugh, I.D.I. and D.O.A. Philip. 1991. The marketing of goats in northern Nigeria. *Small Ruminant Research* 6: 175-178.
- [2]. Ajala, M.K. and Sanni, S.A. 2002. Economics of pig marketing in Kafanchan (Katsit) market, Jama'a Local Government Area of Kaduna State, Nigeria. *Trop. J. Anim. Sci.* (5(2): 59-66. Published by the Animal Science Association of Nigeria (ASAN), University of Ibadan, Ibadan.
- [3]. Ajala, M.K. 2003. Economics of pig production in Jama'a Local Government Area of Kaduna State, Nigeria. *Trop. J. Anim. Sci.* 6(1): 53-62. Published by the Animal Science Association of Nigeria (ASAN), University of Ibadan, Ibadan.
- [4]. Aromolaran, A.B. 1999. Economics of size in poultry egg production in Abeokuta, Ogun State, Nigeria. *Trop. J. Anim. Sci.* 1(2): 197-205. Published by the Animal Science Association of Nigeria (ASAN), University of Ibadan, Ibadan.
- [5]. Bain, J.S. 1968. *Industrial organization*. 2<sup>nd</sup> ed. John Willey and Sons, New York, USA.
- [6]. Barrett, C.B. 1996. Market analysis methods: Are our enriched toolkits well suited to enlivened markets? *American Journal of Agricultural Economics* 7: 825-829.
- [7]. Dipeolu, A., Momoh, S., Jamiu, A.G. 1999. Marketing of sheep and goat in Ogun State of Nigeria. *Trop. J. Anim. Sci.* 2(1): 151-157. Published by the Animal Science Association of Nigeria (ASAN), University of Ibadan, Ibadan.
- [8]. Fafchamps, M. 1997. Introduction: Markets in sub-Saharan Africa. *World Development* 25(5): 733-734.
- [9]. Green Revolution Committee. 1981. *Green Revolution: A Livestock Production Plan for Nigeria*. A study conducted for the Federal Ministry of Agric. National Committee on the Green Revolution.

- [10]. Harris-White, B. 1999. Introduction: Visible hands. In: Harris-White B. (ed.), *Agricultural markets from theory to practice: Field experience in developing countries*. Macmillan Press Ltd., Hampshire, UK, 369pp.
- [11]. Kaduna State Agricultural Development Project (KADP). 1990. Contact Farmers and Extension Agents Visit Schedule in Zango-Kataf LGA, pp. 3-74.
- [12]. Kriesberg, M. 1970. The marketing challenge: distribution and increased production in developing nations. *Foreign Economic Development Report 7*, US Department of Agriculture.
- [13]. Leplaideur, A. 1992. Conflicts and alliances between the international marketing system and the traditional marketing system in Africa and Madagascar: The results of experience with rice and with vegetables in six countries. In: Cammann L. (ed.), *Traditional Marketing systems*. DSE (Foundation for International Development), Feldafing, Germany.
- [14]. Marion, B. 1986. The organization and performance of the US food system. Lexington, Massachusetts, USA.
- [15]. Mellor, J. 1970. Elements of a food marketing policy for low income countries. The marketing challenge: distribution, increased production in developing nations (ed. Martin Kriesberg), *Foreign Economic Development Report 7*, US Department of Agriculture.
- [16]. North, D.C. 1989. Institutions and economic growth: An historical introduction. *World Development* 17(9): 1319-32.
- [17]. Ogundipe, S.O. and Sanni, S.A. 2002. Economics of poultry production in Nigeria. In *Poultry Production in Nigeria: A training manual*. National Animal Production Research Institute, Ahmadu Bello University, Shika – Zaria.
- [18]. Odediji, F.A.B. 1973. The cattle industry in Northern Nigeria, 1900-1939, prepared by the African Studies Program, Indiana University, Bloomington.
- [19]. Olayemi, J.K. 1974. Food marketing and distribution in Nigeria: Problems and prospects. Nigerian Institute of Social and Economic Research (NISER), University of Ibadan, Ibadan.
- [20]. Olukosi, J.O. and Isitor, S.U. 1990. Introduction to Agricultural Marketing and Prices: Principles and Applications, Living Books Series, G.U. Publications, Abuja FCT, Nigeria.
- [21]. Osuhor, C.U., Okaiyeto, P.O. and Ajala, M.K. 1998. Marketing of small ruminants and small ruminant meat in Zaria, Nigeria. In “Animal Agriculture in West Africa – Sustainability Question. Proceedings of the Silver Anniversary of the Nigerian Society for Animal Production, edited by O.O. Oduguwa, A.O. Fanimo and A.O. Osinowo. pp. 432-433.
- [22]. Scott, G.J. (ed.). 1995. Prices, products and people: Analyzing agricultural markets in developing countries. Lynne Rienner Publishers, Boulder, London, UK.
- [23]. Shaffer, J.D. 1973. On the concept of subsector studies. *American Journal of Agricultural Economics* 55: 333-335.
- [24]. Shaffer, J.D. 1980. Food system organization and performance: Towards a conceptual framework. *American Journal of Agricultural Economics* 62(2): 310-318.
- [25]. Staal, S., Delgado C. and Nicholson, C. 1997. Smallholder dairy under transactions costs in East Africa. *World Development* 25(5): 779-794.
- [26]. Shaib, B., Aliyu, A. and Bakshi, J.S. 1997. Nigeria National Agricultural Research Strategy Plan: 1996-2010. Department of Agricultural Sciences. Federal Ministry of Agriculture and Natural Resources, Abuja, Nigeria. pp. 1-335.
- [27]. Williamson, E.O. 1986. Economic organization: Firms, markets and policy control. Harvester Wheatsheaf, Herefordshire, UK.
- [28]. Williams, T.O., Spycher, B. and Okike, I. 2006. Improving livestock marketing and intra-regional trade in West Africa: Determining appropriate economic incentives and policy framework. ILRI (International Livestock Research Institute), Nairobi, Kenya. 122 pp.