International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Index Copernicus Value (2015): 78.96 | Impact Factor (2015): 6.391

Assessing the Structural Arrangement of Small Ruminant Markets in Kumasi and Tamale, Ghana

Kassoh Fallah Samuel[1], Jusufu Abdulai[2], Dr. Kwasi Ohene-Yankyera[3]

Sierra Leone Agricultural Research Institute, Teko Livestock Research Centre, Makeni

Abstract: ***This study sought to analyse the structural arrangement of sheep and goat trading in urban towns (Kumasi and Tamale) of Ghana using descriptive statistics and Herfindahl- Hirschman Index for market concentration. Kumasi and Tamale markets were purposively selected based on the progressive marketing and consumption of sheep and goats in these locations. Multi stage sampling method was used in this study. A pre-survey was carried out in Kumasi and Tamale metropolis in order to identify the existing markets and to generate the sample frame. Ten markets were selected five from each urban centre. A total of 284 traders were randomly sampled from the sampling frame. A semi structured questionnaire was used to collect relevant data. Data analyses were done using descriptive statistics. It was found that majority of the traders sell both sheep and goats and the enterprise is a sole proprietorship. It was also found that 35 animals were in an average batch and two (2) trips were made per month. Four actors were identified (producers, collectors, wholesalers and retailers) in sheep and goats marketing channel. Four channels were also identified and these channels were short with less value added to the animals.It was found that most of the markets were unconcentrated.***

1. Introduction

Livestock including sheep and goats are economically important in the agricultural sector of most developing countries including Ghana. The livestock subsector provides source of income, meat, milk, manure and wool as well as serving as collateral for loan, saving and risk distribution mechanism for smallholder keepers in different farming systems and agro-ecologies in Ghana [9, 21]. Due to capital intensity, disease susceptibility, religious factors and length of production periods, small ruminants (sheep and goats) are better alternatives relative to poultry, pigs and cattle in these regards [21].

Furthermore,[24]mentioned that sheep and goats immensely contribute to household income and offer employment to majority of holders. Sheep and goats are widely distributed and adapted in all agro-ecological zones due to the various adaptive features they possess (higher fertility, shorter generation interval, higher adaptation to harsh environment and ability to thrive on limited feed).

These features enable them to be positive potential investment across the world [15,32]Sheep and goats form a vital environmental niche in the agricultural systems across emerging countries [21].

[10] Reported that the world's population of sheep, goats and cattle was about 176.8 million, 210.5 million and 216.6 million respectively. The distribution of livestock in Africa is wildly spread and with conflicting figures. According to [8], 30% of all tropical livestock units in Africa are concentrated in the arid zone.

Livestock marketing encompasses the sale, purchase or exchange of live animals and their products (milk, meat, skins, wool and hides) for income or other commodities [16]. Marketing as an economic activity bridges the gap between production and consumption and creates linkages between sellers and buyers[13].[2]Suggest that livestock production without recourse to the market is adjudged not self-sufficient as other foods and need will otherwise not be met.

Despite these opportunities, there are marketing challenges that must be addressed in developing a successful small ruminant production system. Improved agricultural marketing in the tropics leads to specialised production and resource allocation efficiency and creates the impetus for government to invest in production and market infrastructure (ibid). The role of marketing in enhancing the benefits of livestock production is so encompassing that it is said to be integral to the livelihoods of livestock producers [2].

Marketing of small ruminants in urban long distance destination markets in Ghana consists of few square meters open space where the goats and sheep are kept for sale [5, 3]. Marketing of livestock is structured through networks of traders linked by personal relationship, ethnicity and family ties [4].The market structure of cattle, sheep and goat is characteristically lengthy (about 3 to 5 stages between producers and consumers) without significant value addition[2, 11].[11]observes that animals sold are mostly male, local breeds with prices determined by bargaining skill , time of sale, distance travelled, body condition, colour, 'weight' and ease of holding and broker involvement, among others.

Another unmistakable feature of livestock markets spatial disconnection between production zone and high consumption zones [13]. The market structure includes producers, traders, retailers, food service providers and consumers. Public and private input and service providers[27]as well as regulatory institutions (taxation, licensing and warranties) are involved [11].[25]Identified auction sales, sales to abattoirs, speculators and private sales as the major modes of sales of livestock, with sales to abattoirs and speculators providing the most access to price information. A poorly functioning market of small ruminants could bring up about huge inequities in income distribution owing to exploitation by middlemen caused by guile and opportunism exhibited in the marketing system [13]. Such acts have the potential of making the overall performance in

sheep and goat marketing highly inefficient with few benefiting due to market powers at the expense of others. Perceptions of extortion could lead to demotivation with attributed propensity of further excommunicating smallholders from market participation. These raise questions about what impacts such a structure of small livestock markets may pose to the drive to mitigate effects of poverty via commercialising livestock production. Hence, this study seeks to unravel the structural arrangement of small ruminants markets of sheep and goats in both Kumasi and Tamale which is quite imperative for enhancing efficiency and improving the overall benefits of all stakeholders. The purpose of this study is therefore to analyze the urban small ruminants (Sheep and Goat) markets in Ghana.

2. Theoretical and Conceptual Framework to Market Study (Structure and Performance Paradigm)

The Structure Conduct and Performance concept is the brain child of the Harvard school of thought. It was derived from the neo-classical analysis of markets and popularized during 1940-60 with empirical work involving the identification of correlations between industry structure and performance [31]. The structure, conduct and performance (S-C-P) approach has been used in the study of markets in many countries [20]. The S-C-P model is one of the most common and pragmatic approaches of evaluating a marketing system with applications in social, political, economic and physical environments [18]. In the S-C-P model, it is assumed that there is a causal relationship starting from the structure, which determines the conduct and these together determine the performance of agricultural marketing system in developing countries [22].

According to [6], market structure refers to the relatively stable features that influence the rivalry among the buyers and sellers operating in a market. Markets are classified as perfectly competitive, oligopolistic and monopolistic markets based on structural characteristics [30]. [29]Indicate that the structure of the market is normally evaluated by examining the concentration of market and accessing the entry and exit conditions. Empirically, market concentration (structure) is measured via concentration ratios, Herfindale-Hirschman Index, Gini Coefficient and the Rosenbluth index [7].

Marketing channels are the sequence of intermediaries or alternative routes (paths) of product flows from producers (sources of original production) to consumers/ ultimate destination [18, 23], a series of operations that physically bring goods to final consumer. Marketing channels are components of the structure of the market [14].

Sheep and goats are traded via several marketing channels from farmer to final consumers in both the internal and international markets, which are said to be lengthy but without significant value-added activities [27]. Market channels are considered to be long or short depending on the source, nature and quality of the product marketed [17]. From farmer to ultimate consumers, agricultural produce/livestock may pass through or be sold to wholesalers, retailers, processors, marketer/grower groups and storage operators among others[27, 28].

3. Material and methods

3.1 The Study Area

Among the 30 districts in the Ashanti region, Kumasi was purposively based selected based on the production and distribution patterns of sheep and goats in the country. Kumasi metropolitan can be found in the transitional forest zone. Kumasi is located on Latitude 6^0 4' 0" North and longitude 1^0 41' 0" with an area of 256 square kilometres. Largely, it shares boundaries with the Kwabre District to the north, Atwima Kwanwoma and Atwima Nwabiagya District to the west, Ejisu-Juaben Municipal to the east and Bosomtwe to the south. Kumasi municipality is the most populous district in the Ashanti Region and has a population of 2,035,064 with an annual growth rate of 4.8% with an estimated population with a project population of 2013 is about 2,396,458.

Whereas Tamale metropolis is also situated in the central part of the Northern Region and shares boundaries with five other districts namely Savelugu-Nanton to the north, Yendi Municipal Assembly to the east, Tolon-Kumbungu to the west, Central Gonja to the south west and East Ganja to the south. Tamele is found on Latitude 9° 24' 0" North and 0° 50' 0" and has a total estimated land size of 550 square kilometers [12].

According to[12]report Tamale metropolis is located about 180 meters above sea level with a few isolated hills. It has a 2013 projected population of 562,919 according to the 2012 census, making it the third largest settlement in Ghana and the fastest growing city in West Africa. Most Tamale residents are moderate followers of Islam, as reflected by the multitude of mosques in Tamale [12].

3.2 Sampling and Data Collection

A multi-stage sampling method was used to carry out this study. Two districts were purposively selected based on the production, distribution patterns of sheep and goats and the geographical disjoint in production and consumption of livestock in the country. A reconnaissance survey was carried out in Kumasi and Tamale metropolis in order to identify the existing markets and to generate the sample frame. Informal interviews were conducted using key informants such as knowledgeable people, heads, and experienced traders. Based on the result of the reconnaissance survey, five (5) major markets, namely: Mayanka, Suame kotoko, Akwatia line, Sofoline/Kwadaso and Abenchi in Kumasi; and five major markets, namely: Aboabo, Sakasaka, Sheshegu, Katinga and Sagnariga in Tamale were selected for the study based on the appreciable number of small ruminant traders in the named markets. A disproportionate stratified sampling technique was adopted to obtain a sample of traders in each market/stratum representing the proportion of the chosen sample size. Finally, a sample size of 284 small ruminant traders was

generated from a population of 510 using the sample size calculator from Survey systems.

Primary and secondary data were utilized during data collection. The primary data on small ruminant markets were sourced from goats and sheep traders using a pre-tested semi- structured questionnaire. In addition to the questionnaire, focus group discussions (FGD) and key informant interviews were used in data collection. Two (2) markets and six traders were purposively sampled based on the number of traders, and that they serve as the major livestock markets in the study area. During the data collection, sheep and goats were grouped into three categories: small, medium and large size classes based on their prices.

The secondary data were sourced from relevant journals, textbooks, internet and other related research projects, which includes extensive review of relevant literature on small ruminant markets, and livestock production estimates.

3.3 Data analysis

Descriptive statistics such as frequency distribution tables, arithmetic means, standard deviation, and percentage were used to analyse the marketing channel and Herfindahl-Hirschman Index (HHI) was used to analyse market concentration.

3.4 Market concentration measures

Market concentration refers to number and size of sellers and buyers and shares they hold in the market. When few traders handle bulk of the shares in the market the degree of concentration will be the possibility of non-competitive behaviour, such as collusion existing in the market.

[7] assessed some of the instruments used in measuring degree of competition of a firm (market concentration of the firm); these include Herfindahl-Hirschman index (HHI), Concentration ratio (CR), Rosenbluth index (RI) and the Gini Coefficient (GC). These methods differ mainly according to their weighting tactic; sensitivity of the index to changes at the tail-end of the farm size distribution and structure; advantages and disadvantages.

Herfindahl- Hirschman Index (HHI)

HHI refers to the sum of the squares of the market shares of the fifty largest firms or summed over all the firms if there are more than 50 within the industry, where the market shares are either expressed as fractions or percentage [19]. In calculating the HHI the number and size distribution of all firms is also considered. By and large, squaring the individual market shares gives more weight to the shares of the largest firms which is an advantage over concentration ratio and others. It is the most widely-treated summary measure of concentration in the theoretical literature and often serves as a benchmark for the evaluation of other concentration indices. Despite wide application and importance of HHI, the method requires a huge sum of data.

The market share and concentration ratios are used in establishing the type of market in operation. This study adopted Herfindahl-Hirschman index (HHI) in assessing market concentration due the advantages it has over the other indices. That is, in computing HHI the study considered all participants and it also gave more weight to the individual market share by squaring the market share expressed as a percentage. It also used as benchmark for evaluating other indices.

To arrive at the index, market share was computed by using the quantities of sheep and goats handled by each trader in a year. Since record keeping is a major issue in live sheep and goats trade, quantity of animals traded in 2014 was computed by extrapolation, that is, average quantity of sheep and goats (SG) traded per trip; number of trips made per month and number of months traded per year were considered. However, the closer a market the higher the market's concentration and the lower its competition (Monopoly). For instance, if a firm exists in the market that firm would have 100% market share, and the HHI would equal 10,000, signifying a monopoly. On the other hand, if there were thousands of firms competing, each would have nearly 0% market share, and the HHI would be close to zero, indicating nearly perfect competition. HHI ranges from 0.1 to 1 or (1000 to 10,000) that is moving from efficiency to inefficiency in the market. Based on this,[26] suggested a rule of thumb: an index below 0.1 is considered to be unconcentrated market and implies that, the market is controlled by many participants (competitive market), when an index is between 0.1 to 0.18 indicates moderately concentrated market, that is the market is controlled by few traders (oligopolistic) and when the index is above 0.18, it is highly concentrated (monopolistic).

The Herfindahl-Hirschman is express mathematically as:

$$HHI = \sum_{i=1}^{n} s_i^2 \qquad [1]$$

Where: HHI=Market concentration of i^{th} firm, S_i = is the market share of i^{th} firm, and n = total number of firms.
Empirically market concentration of small ruminant in Kumasi and Tamale metropolis is computed by using the number of sheep and goats handles by each trader during the period of research as follows:

$$HHI = \sum_{i=1}^{n} S_i^2 \qquad [2]$$

$HHI =$ Market concentration of indigenous small ruminant traders in Kumasi and Tamale
$S =$ Market share that is, quantity of animals handled by SG traders in Kumasi and Tamale
$n =$ Total number of traders in the Kumasi and Tamale involved in selling goat and sheep in the study areas.

4. Results and Discussions

4.1 Enterprise Characteristics

Table 1 shows results for procured average number of sheep and goats (SG) and trips made per month. The result shows

that an average batch of 35 live animals. Test of means shows that the average number of SG handled in an average batch and number of trips made during a month was significantly higher in Kumasi at 1% significance levels respectively. About 41 animals and three trips per month were made in Kumasi whereas in Tamale, 29 animals and two trips were made per month. Higher demand of SG in Kumasi is associated with low production of livestock, high income level of inhabitants and preference of high value food animal protein and consumers depend wholly on the market for animal protein

Table 1: Average SG Traded per Batch and Number of Batches per Month and Year

	Kumasi			Tamale			Pooled			Test of mean	
Animal Quantity	Freq.	Mean	SD	Freq.	Mean	SD	Freq.	Mean	SD	t-stat	P-value
Total Goat	145	28.93	19.99	118	16.87	11.84	263	23.52	17.84	17.24	0.00
Total SG traded	148	41.01	31.57	135	29.24	19.16	283	35.4	26.99	17.15	0.00
Trips										t-stat	P-value
Trips per month	149	3.01	0.82	135	2.18	0.77	284	2.62	0.90	2.44	0.02
Trips per year (2014)	149	39	9.5	135	33.09	28.15	284	36.21	20.77	2.42	0.02

Source: Field survey, 2015

Table 2 presents the state of ownership in sheep and goats enterprise. It was found that 83.5% of the traders sell both sheep and goats. It is not surprising that majority of the traders, 83.9% and 81.0%, respectively, in Kumasi and Tamale were involved in both sheep and goats trade. Only 15.4% and 14.8% were engaged solely in goats or sheep enterprise in the respective study areas. In assessing the nature of ownership structure of the SG trade, 93.0% of the traders owned their enterprises as seen in the pooled sampled, from Kumasi (98.0%) and Tamale (87.4%). Enunciating views of respondents for involving in sheep and goats trade revealed that inheritance from family members, as indicated by 19.4% of the pooled sample, was the major reason for their involvement in livestock marketing. Subsequently, it was found that profitability of the investments 18.8%, experience in trading 14.8%, and low level of education 12.8% were the major reasons for traders in Kumasi involving in live SG trade. In Tamale, issues ranging from inheritance from family members, profitability of the investments and availability of animals were highlighted by 27.4%, 19.3%, and 16.3%, respectively as major reasons for embarking on sheep and goats investments.

Table 2: Enterprise Characteristics

Variables		Kumasi		Tamale		Pooled	
	Categories	Freq.	%	Freq.	%	Freq.	%
Type of enterprise in 2014	Sheep and goat enterprise	125	83.90	112	83.00	237	83.50
	Goat only enterprise	23	15.40	3	2.20	26	9.20
	Sheep only enterprise	1	0.70	20	14.80	21	7.40
	Total	149	100	135	1000	284	100
Ownership structure	Sole ownership	146	98	118	87.40	264	93.00
	Jointly owned by family members	1	0.70	6	4.40	7	2.50
	Partnership	2	1.30	11	8.10	13	4.60
	Total	149	100	135	100	284	100
Reasons for trading Small Ruminants	Major source of income	11	7.40	16	11.90	27	9.50
	Profitable	28	18.80	26	19.30	54	19.00
	Low capital requirement	20	13.40	19	14.10	39	13.70
	Always available at the source	9	6.00	22	16.30	31	10.90
	High demand for SG	3	2.00	4	3.00	7	2.50
	Minimal holding ground	5	3.40	-	-	5	1.80
	Inheritance from family member	18	12.10	37	27.40	55	19.40
	Low level of education	19	12.80	2	1.50	21	7.40
	Experience in SG trade	22	14.80	9	6.70	31	10.90
	No other job available	14	9.40	-	-	14	4.90
	Total	149	100	135	100	284	100

Source: Field survey, 2015

4.2 Source (s) and flows of small ruminants into the domestic live small ruminant market

Marketing channel refers to a medium or a path along which small ruminants flow from their supply source to the urban markets by market actors till the product reaches the final consumers. Figures 2 and 3 show the physical flows of SG from their sourced areas to the urban markets in Kumasi and Tamale, respectively. The results show four major marketing channels through which sheep and goats are conveyed to the urban markets. Despite the higher prices charged by wholesalers, 59.1% and 45.2% of the retailers in Kumasi and Tamale respectively purchased SG from wholesalers. The reason for wholesalers' dominance in sheep and goats marketing lies in their ability to purchase large volume of flocks at a time. Moreover, trading animals like SGs require huge initial and operational capital outlay which can hardly be met by retailers. The study is consistent with those of [1]who reported a similar situation in pig markets in Zango Kataf of Nigeria that pig marketing required a huge sum of

initial outlay. Thus, retailers are left with little or no option than buying from wholesalers. Their inability to purchase SGs on their own is also remedied by taking products on credits from wholesalers, hence enabling sustainability and continuity in livestock trading and marketing by all actors along the channel. It was also understood from the focus group discussions (FGD) that retailers were afraid of sourcing livestock from outsiders due to issues of theft and other associated problems.

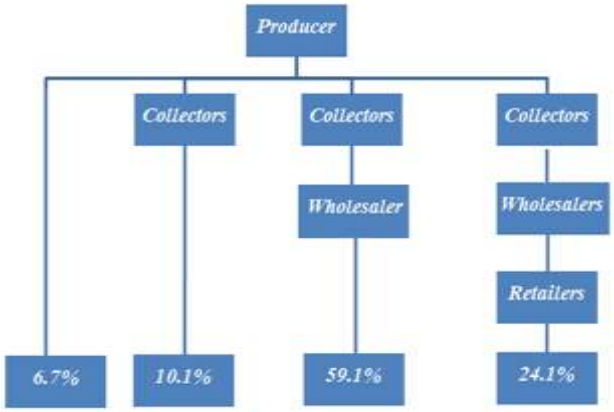

Figure 1: Marketing Channel of Sheep and Goats in Kumasi
Source: Field survey, 2015

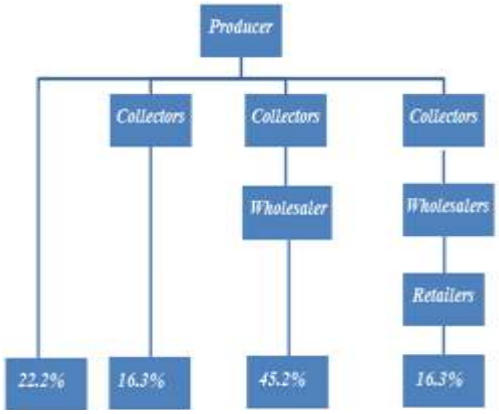

Figure 2: Marketing Channel for Sheep and Goats in Tamale
Source: Field survey, 2015

The figures also show that 24.1% of the traders in Kumasi sourced their products directly from other retailers in other markets, while 22.2% traders in Tamale obtained a significant amount of SG from producers. The chain of product flow is from producers to primary traders (assemblers, collectors) who buy in small quantities from farmers and sell to secondary traders (wholesalers). The secondary traders buy both from producers and primary traders and sell to retailers and consumers. In addition, retailers buy from wholesalers, primary traders and farmers and sell to other retailers from other market destinations and consumers.

Furthermore, the survey results have shown that collectors sell to the rural wholesalers and the commission agents along the channel. These two set of mediators sell either to the rural retailer or urban wholesalers. The rural retailers then sell to the rural consumer's while the urban wholesalers sell to the urban retailers. Finally, the urban retailers sell to the urban consumers such as butchers, restaurants and individuals.

The aforementioned actors are, however, the major actors linking the sheep and goat marketing channels in the stipulated study areas. Thus, a limiting factor to the number of animals a middleman is able to buy at any given time is the amount of operating capital and availability of the animals from sourced areas. Based on the results obtained from the survey there was no fixed pattern in the flow of animals from their various origins to the urban markets in the aforesaid locations of the study

4.3 Assessment the roles played by traders, labour and traders' associations in small ruminant enterprise

Market structure refers to the vertical and horizontal integration of enterprises. In this regard, this study assesses the roles of individual SG enterprise in trade as well as the interaction and functions of vendor associations and labour. Table 3 shows results of the multiple roles played by SG traders and multiple contributions of SG traders' associations.

The study revealed that SG traders are mainly operating as retailers. There are relatively more retailers (79%) in Tamale than in Kumasi (62%), whereas Kumasi has more wholesalers (29%) relative to Tamale (23%). One other remarkable feature of the urban markets is trader involvement in production, collection and processing of small ruminants. There are about four times more traders engaged in production in Tamale compared to Kumasi, whereas there are two times as many traders in Kumasi processing live SG. The above is indicative of traders riding on the comparative advantages offered by economic (Kumasi) and agro-ecological (Tamale) forces due to location.

Some 10% of all traders play the role of transporters in the two urban markets. Most of these people (21 out of 26) are located in Kumasi. About 50% of all traders mentioned the presence of associations in the local market where they operate. Eighty-four (84) of these traders were in Kumasi, an indication of higher prevalence of SG traders' associations in Kumasi relative to Tamale. It was found that about 95% of the traders in all the markets were members of the trader associations.

In all, (47%) traders in Kumasi and (36%) in Tamale provided responses when interrogated about the roles of traders' associations. A total of 231 responses were made out of which (58%) emanated from Kumasi. About 31% of traders were in trade associations in Kumasi, and they were mentioned as being useful in setting trading rules, whereas the majority of those in Tamale (25%) cited regulation of entry by new entrant as the most common function. Other major roles of traders' associations include regulator engagements, aiding access to credit and, to a very limited extent, price setting (only 12% of respondents reporting such).

Table 3: Trader Roles in SG Marketing

	Kumasi			Tamale			Pooled		
variables	Freq.	Group %	Case %	Freq.	Group %	Case %	Freq.	Group %	Case %
Role of trader in SG trade									
Producers	6	2.8	4.2	23	11.7	17.3	29	7.1	10.5
Collectors	29	13.7	20.4	16	8.2	12	45	11	16.4
Transporter	21	9.9	14.8	5	2.6	3.8	26	6.4	9.5
Wholesalers	62	29.2	43.7	31	15.8	23.3	93	22.8	33.8
Retailer	88	41.5	62	105	53.6	78.9	193	47.3	70.2
Processor	6	2.8	4.2	16	8.2	12	22	5.4	8
Total	212	100	149.3	196	100	147.4	408	100	148.4
Presence of an association	84		56.37	57	42.22		141		49.65
Membership of the association	83		98.9	51	89.47		134		95.04
Contribution of association									
Price setting	13	9.8	18.6	14	14.3	29.2	27	11.7	22.9
Setting trading rule	41	30.8	58.6	22	22	45.8	63	27.3	53.4
Grant access to new entrances	14	10.5	20	25	25.5	52.1	39	16.9	33.1
Engagement with regulations	32	24.1	45.7	20	20.4	41.7	52	22.5	44.1
Aiding in accessing credit	33	24.8	47.1	17	17.3	35.4	50	21.6	42.4
Total	133	100	190	98	100	204.2	231	100	195.8

Source: Field survey, 2015

Another structural issue evaluated is the staff strength, activities performed and levels of wages (See Table 4). It was found that (42%) of all traders managed their trade with paid workers and (55%) used unpaid labour. Paid labourers were used by more traders in Tamale (47%) relative to Kumasi (37%).

Two (2) paid labourers were employed per enterprise in Kumasi and were more actively involved in selling and feeding of animals during the sales period. One paid worker and about two to three unpaid workers usually help in transporting animals among Kumasi traders. In Tamale however, feeding is handled by the unpaid aids (mostly family members) that also help hired labour in selling and transportation activities.

Table 4: Number of Paid and Unpaid Labour Performing Trade Activities in SG Trade

Labour category and activity	Kumasi			Tamale			Pooled		
	Mean	Freq.	SD	Mean	Freq.	SD	Mean	Freq.	SD
Paid workers									
Collection	1.67	39	0.77	1.48	42	0.77	1.57	81	0.77
Transportation	1.00	5	0.00	1.80	5	0.84	1.40	10	0.70
Selling	1.58	12	0.51	1.63	19	0.68	1.61	31	0.62
Feeding	2.00	3	0.00	-	-	-	2.00	3	0.00
Total paid Labour	1.75	55	0.80	1.56	63	0.78	1.64	118	0.79
Unpaid workers									
Collection	1.92	12	1.00	2.22	18	0.88	2.10	30	0.92
Transportation	2.80	5	2.05	2.75	4	2.06	2.78	30	1.92
Selling	1.83	12	1.11	1.72	18	0.96	1.77	9	1.01
Feeding	-	-	-	3.00	2	0.00	3.00	2	0.00
Total unpaid labour	2.03	29	1.27	2.10	42	1.08	2.07	71	1.15
Total Labour	2.07	75	1.23	2.30	81	1.40	2.19	156	1.32

Source: Field survey, 2015

Transportation was found to be the most expensive of the activities performed by labour with an average cost of GH¢ 12.00 paid to each worker by only 5 enterprises. Feeding of animals on the other hand was found to be the least, costing about forty Ghana pesewas (40p) per animal in 2014. About GH¢ 3.00 was paid to each employee for selling an animal and a similar amount paid for purchasing an animal during animal mobilization for haulage to markets. These costs are generally similar among all traders with only minor differences. Table 5 displays per animal cost of the major activities imperative in SG trade.

Table 5: Labour Cost of Activity per Animal

	Kumasi				Tamale				Total			
Cost (GH¢)	Freq.	Mean	Range	SD	Freq.	Mean	Range	SD	Freq.	Mean	Range	SD
Collection	39	3.56	3.00	1.12	42	3.00	4.00	1.04	81	3.27	4.00	1.11
Transportation	5	12.00	5.00	2.12	5	10.60	7.00	2.61	10	11.30	7.00	2.36
Selling	12	3.17	3.00	1.27	19	2.26	4.00	0.93	31	2.61	4.00	1.15
Feeding	3	0.40	0.30	0.17	-	-	-	-	3	0.40	0.30	0.17
Total labour cost	55	4.33	14.80	2.98	63	3.52	19.00	2.88	118	3.90	19.80	2.94

Source: Field survey, 2015

Analysis of Prevailing Structural Arrangements in Urban Small Ruminant Market

The most important instrument in measuring market structure is the use of market concentration proxy. In this study, the structure of small ruminant market in each market was evaluated by measuring market concentration and assessing the condition of entry.

The index of market concentration was computed in all sampled markets in the study area. The results are presented in Table 6 depicts the existence of competitive market structure of SG traders in Mayanka, Suame Kotoko, Abenchi, Akwatialine and Kumasi having HHI of 0.0480, 0.0400, 0.0970, 0.0587 and 0.0587, respectively. These results imply that the volume of SG handled is relatively more equitably distributed among traders and the market is not influenced by a single or few traders. Sofoline was the only market found concentrated (weak Oligopoly) with an HHI of 0.1130. On the other hand, the result in Table 6 revealed that the five sampled market in Tamale were unconcentrated with an HHI of 0.0537, 0.0762, 0.0600, 0.0644, 0.0467 and 0.0103 in Aboabo, Sakasaka, Katinga, Sagnarigu, Sheshegura and Tamale, respectively. It means that the volume of animals stock traded and the operational capital was relatively equitably distributed among traders.

Table 6: Summary Result of Market Concentration of Sheep and Goats Traders

Name of markets	HHI	Nature of the market	Name of Markets	HHI	Nature of the market
Mayanka	0.05	Unconcentrated	Aboabo	0.05	Unconcentrated
Suame Kotoko	0.04	Unconcentrated	Sakasaka	0.08	Unconcentrated
Abenchi	0.09	Unconcentrated	Katinga	0.06	Unconcentrated
Sofoline	0.11	Moderately concentrated	Sagnarigu	0.06	Unconcentrated
Akwatialine	0.06	Unconcentrated	Sheshegu	0.05	Unconcentrated
Kumasi	0.01	Unconcentrated	Tamale	0.01	Unconcentrated

Source: Field survey, 2015

5. Conclusions

This study sought to analyse, urban small ruminant markets, focusing on the structural arrangement of sheep and goats market in Ghana. This study was inspired to provide accurate analysis of the sheep and goats trade in urban centres of Ghana. It also provides the choice of supply channel parameters that will aid urban traders and livestock policy designers.

A total of 284 traders were randomly sampled from the sampling frame. A structured questionnaire was used to collect relevant data. Data analyses were done using descriptive statistics and inferential statistics. It was found that majority of the traders sell both sheep and goats and the enterprise is a sole proprietorship. The number of animals traded in an average batch was 35 animals and two (2) trips were made in a month. Kumasi traders traded more animal and made more trips as compare to Tamale traders.

This study found that participants in the live sheep and goats' trade were producers, collectors, wholesalers and retailers. Four major channels were identified. Producers-Retailers-Consumers, Producers-Collectors-Retailers-Consumers, Producer-Collectors-Wholesalers-Consumers and Producers-Collectors-Wholesalers-Retailers-Consumers in sourcing sheep and goats and the channels were short with less value added to the products.

The study found that most of the markets were unconcentrated with decline of new entrants and the quantity of animals traded. This decline is due to limited quantity of sheep and goats supplied due to high start-up capital and inadequate supply of credit. If this decline continues for the next 10 years, small ruminant's trade will be left in the hands of few traders, which will lead to a concentrated market. Therefore, the findings of this study suggest that policy makers and other stakeholders should intervene by providing credit facilities at low interest rates; and encouraging farmers to increase production.

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