

An Analysis of the Value Chain for Indigenous Chickens in Zambia's Lusaka and Central Provinces

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Received: June 4, 2014 Accepted: June 16, 2014

doi:10.5296/jas.v2i2.5918 URL: <http://dx.doi.org/10.5296/jas.v2i2.5918>

Abstract

Despite the enormous potential that indigenous chickens (*Gallus gallus domesticus*) have for sustaining livelihoods, their production and marketing has been mostly neglected resulting in the sub-sector being highly underdeveloped with poor linkages between producers and consumers. The main objective of this study was to map and analyze the value chain for indigenous chickens in Lusaka and Central Provinces of Zambia. The study also analyzes the value added and the associated costs in the chain. Findings show that although almost all (99 percent) of smallholder households keep indigenous poultry, productivity and production is very low leading to low and unplanned sales. Low production is due to high mortality of indigenous chickens mainly as a result of limited producer knowledge of methods of disease prevention and breeding practices. The absence of processing along the value chain means that chickens are sold live (in open markets) and consequently cannot be retailed through formal channels like supermarkets leading to exclusion of potential middle and high income consumers. Although the value chain for indigenous chicken shows positive gross margins for all the players along the chain, there is need to address the various constraints affecting the value chain in order to improve the operation of the chain and hence lead to increased

incomes for the value chain actors and at the same time ensuring cheap delivery of indigenous chicken in a more convenient form and in formal outlets.

Keywords: Indigenous chickens, Value chain, Chicken consumption, Zambia

1. Introduction

1.1 Background

The livestock sector is important to Zambia as it contributes about 42 percent of the national agricultural output. The sector has potential for growth especially among smallholder farmers. Available statistics show that in 2001, the livestock population was estimated at 1.5 million cattle, 1.2 million goats, 500,000 pigs, and 51,000 sheep. By 2008, the population of livestock had grown to about 2.8 million cattle, 2.4 million goats, 1 million pigs, and 157,000 sheep (Lubungu, *et al.*, 2012). In 2001, poultry production was estimated at around 12 million broiler birds, 3 million commercial layers and 11 million indigenous chickens. By 2011, the country increased its poultry production to an estimated 36 million broiler birds, but the population of commercial layers was stagnant at about 3 million birds (Songolo, 2001; Ngosa, undated). A majority of the rural households in Zambia keep flocks of village or indigenous chickens (*Gallus gallus domesticus*) with little inputs. The indigenous chickens serve as the main source of protein; income through sales of eggs and birds; and essential goods and services through barter (Haazele *et al.*, 2002). There is also a link between indigenous poultry production and pro-poor livestock policies. According to Dolberg (2003), considering that the majority of indigenous chickens are owned by women, growth of the sub-sector is likely to be pro-poor as money in the hands of women tends to bring about educational and nutritional benefits to the children and households in general.

Although indigenous chickens tend to have lower feed efficiency, their economic strength lies in the low cost of production when compared to the value of their outputs (King'ori *et al.*, 2003; Tadella *et al.*, 2003). Unlike broiler production for which feed purchases constitute over 65 percent of the cost of production (Zambia Poultry Association, 2010), indigenous chicken mainly survive on scavenging. They also fetch a premium price in Zambia as the meat is highly preferred to that of broiler chickens, especially among the affluent, due to its low fat content.

The role of indigenous chicken in asset creation and as an entry point to improved livelihoods among the resource-poor rural households in Africa has been well-documented. Okello *et al.*, (2010) and Magothe *et al.*, (2012) show that in Kenya, indigenous chickens play a significant role in contributing to the nutritional and economic welfare of resource-poor rural households through provision of protein and cash income. Indigenous chickens have also been found to play a significant role in the fight against HIV and AIDS in Zimbabwe where women and child-headed households have used them as part of their consumption-smoothing strategies when incomes fluctuate due to various shocks (Mutenje *et al.*, 2008). Indigenous chickens have also been used as a source of high quality protein and micronutrients in Mozambique and Zambia where households headed by widows and children find them as the easiest species of livestock to produce (Alders *et al.*, 2007; Simainga *et al.*, 2010; Simainga *et al.*,

2011). In Botswana, Moreki and Dikeme (2011) report that indigenous chickens provide a first step in the process (livestock ladder) of acquiring larger livestock such as goats and cows for resource-poor, HIV and AIDS-stricken households. Government agencies and development organizations have also acknowledged the role of indigenous chicken in poverty alleviation. In Zambia, evidence from vulnerability assessments by the National Disaster Management and Mitigation Unit (DMMU) show that households with chickens are better able to survive droughts and recover the following year than households without chickens (DMMU, 2008).

Ownership of indigenous chicken has been shown to have a direct or indirect influence on improving livelihoods. For instance, as a source of eggs and meat, indigenous chicken can also contribute to human capital formation through the positive influence that consumption of food of animal origin has on poor people's health (Perry *et al.*, 2002; Mack *et al.*, 2005). Similarly, Asem-Bansa *et al.* (2012) show that indigenous chicken can contribute to increased availability and access to micronutrient-rich animal protein in Sub-Sahara Africa where diets are predominantly plant-based and micronutrient deficiencies in children are highly prevalent. They also contribute towards increased natural capital through provision of manure that can be used in maintaining soil fertility.

According to Dolberg (2004), strategies that use poultry production for livelihood improvement and poverty alleviation are likely to be most relevantly applied in the countries where it has been most difficult to get development moving. Pica-Ciamarra and Otte (2010) show that there is evidence that investment in small-scale poultry farming generates handsome returns and contribute to poverty reduction and increased food security in regions where a large share of the population keeps some poultry birds. This is the case in Zambia where over 95 percent of rural households have been shown to keep flocks of indigenous chicken (Simainga *et al.*, 2011; Haazele *et al.*, 2002). However, regardless of the enormous potential that the livestock sector (poultry inclusive) has for contributing to national development, the sector has been mostly neglected as most policies on agriculture have been biased towards crop production (Yambayamba and Musukwa, 2007). Furthermore, the little effort given to livestock is mostly directed at cattle while poultry and other small livestock get very little attention. Consequently, the indigenous poultry sub-sector is still highly underdeveloped with poor linkages between producers and consumers. For instance, information on the market players, the market size and market constraints are often lacking. Furthermore, the few studies done on the sub-sector are focused on the production side while the marketing aspect has been neglected (Haazele *et al.*, 2002; Yambayamba and Musukwa, 2007). Consequently, growth of the sub-sector is constrained by lack of information and a poor marketing system.

This study was therefore motivated by the need to contribute to knowledge about markets for local poultry in Zambia. The main objective of this study was to map and analyze the value chain for indigenous chickens in Zambia. The study specifically identifies the major players in the value chain for indigenous chickens in Lusaka and Central Provinces of Zambia. The study also analyzes the value added and the associated costs in the chain.

2. Conceptual Framework

This study employs a Value Chain Analysis (VCA) framework to understand the value chain for indigenous chickens in Lusaka and Central provinces of Zambia. As defined by Kaplinsky and Morris (2001), the value chain describes the full range of activities which are required to bring a product or service from conception, through the different phases of production (i.e. involving combinations of physical transformation and the input of several producer services), delivery to final consumers and final disposal after use. The VCA seeks to understand the various factors that drive the incentives, growth, and competitiveness within a particular industry and identify opportunities and constraints to increasing benefits for stakeholders operating throughout the industry. This feature of VCA lends to its completeness as a strategic tool in exploring different alternative strategies for poverty reduction (AsiaDHRRA, 2008). The purpose of analyzing the value chain for indigenous chickens is to identify key points of intervention along the chain and to recommend specific policy directions to enhance the competitiveness of the indigenous chicken sub-sector. The analysis is premised on the assumption that different agents across the value chain behave based on key market signals and moderating variables provided by the enabling policy, economic and technical environment. Producers, wholesalers, processors and consumers interact based on specific capital requirements and information they obtain from various market sources. Furthermore, dynamics of market interactions are balanced by the conditions set forth by different market policies, technological advancements, and socioeconomic, cultural and environmental concerns (AsiaDHRRA, 2008).

This VCA framework has been widely used to study the indigenous poultry sub-sector and its effects on the livelihoods of the rural households in Less Developed Countries (LDCs) of Africa and Asia. For instance, Okello *et al.* (2010) used the framework to examine the indigenous and commercial hybrid poultry systems with the aim of identifying the actors, assessing poultry and poultry products flows as well as highlighting some of the policies and regulations relevant to potential outbreaks of Highly Pathogenic Avian Influenza (HPAI) in Kenya. The framework was also used in Kenya to study the indigenous chicken sub-sector in terms of organizational aspects, sub-sector map revision, value chain mapping and isolation of constraints as well as matching of opportunities (Mathuva, 2005). In Ghana, Asem-Bansah *et al.*, 2012 used a value chain framework to qualitatively assess backyard poultry enterprises with the aim of understanding how the activities and relationships among the actors along the chain influence enterprise performance and its implications for development of the industry.

Value chain analysis of indigenous chicken has also been used in Asia. Particularly, it has been used in Cambodia with the aim of contributing to the process of linking rural industries and enterprises into the mainstream markets, as well as providing information to help policy-makers harness and maximize the benefits of the value chain and developing strategic linkages between chicken producers, market players and consumers (ASIADHRRA, 2008). It has also been used in Myanmar with the aim of finding ways to increase incomes, improve market access and improve children's well-being for the poorest households and communities (Thi Mar Win, 2012). Similarly, as part of a larger framework of studies supported by the Food and Agricultural Organization (FAO), Sudarman *et al.* (2010) used VCA to understand

the impacts of HPAI as well as highlight the direct commercial and livelihood impacts and potential socio-economic risk factors emanating from the indigenous chicken value chains in Indonesia.

3. Methodology

3.1 Data Collection and Study Areas

Both secondary and primary data was collected and utilized for this study. The secondary data was gathered through desk research and key informant interviews. Secondary data was collected through a review of published and unpublished material including past value chain studies. The main archival data was collected from the relevant websites, documents, reports and academic papers and journals. Focus of the review and key informant interviews was on the specific research objectives as outlined above and to highlight any pertinent issues concerning the value chain for indigenous chickens in Zambia.

The primary data was collected from farmers in Zambia's Lusaka and Central Provinces. Data was collected from smallholder farmers in Chibombo and Mumbwa Districts as well as assemblers/wholesalers, retailers, processors and final consumers from Lusaka District. Multi-stage sampling was used in selecting the farming households. The first stage involved selecting the districts surrounding Lusaka, leading to Chongwe and Mumbwa Districts being purposively selected from a list of districts surrounding Lusaka District that include Chibombo, Kafue, Mumbwa and Chongwe. The main reason for their inclusion is that they represent the largest proportion of rural households producing local poultry that is consumed in Lusaka among the surrounding districts. The second stage involved selecting the villages within these districts and finally the final units (the farm households). Using area maps, 10 villages were randomly selected from each district. Selecting the individual households involved starting from a central place such as a market place. Then each n^{th} household was interviewed in each direction until the quota for each village was reached (15 farm households). In total, the sample comprised of 315 households of which 161 were drawn Chongwe and 154 from Mumbwa.

For the consumer households (Lusaka District), the aim was to analyze the data in clusters based on income. For this purpose, the district was divided into low income, middle income and high income residential areas so as to be able to assess the effects of income on consumption of indigenous poultry. A list of suburbs in each cluster was used as a sampling frame from which a list of suburbs was selected. Starting from a central starting point, every n^{th} household was interviewed (depending on size of the suburb) until the quota was reached. The total consumer sample size was 297 households (that is 97 households from high income households; 74 households from middle income households and 126 households from low income households).

For each suburb selected, the closest market was selected and a minimum of three indigenous poultry traders (retailers) interviewed. This gave a total sample of 30 indigenous poultry retailers. For the processors, the restaurants were classified into two categories; those around the town center (central business district) and those in the periphery markets. A total sample

of 30 restaurants was included in the sample. The wholesalers/assemblers were drawn from Soweto and Chibolya markets (the largest wholesale markets for indigenous poultry).

3.2 Data Analysis

For purposes of this study, descriptive data analysis was employed to characterize the value chain for indigenous chickens in Zambia. The data collected was analyzed to identify the main actors and to characterize the key structure or elements of the value chain. Quantitative and qualitative data collected from documents and key informants was also analyzed to assess the costs and value addition activities in the marketing chain for indigenous chickens. A descriptive-analytical narrative was used to present the findings from the study in order to have a comprehensive picture of the key issues concerning the value chain for indigenous chickens, particularly, in Lusaka and Central Provinces of Zambia.

4. Results and Discussion

4.1 Value Chain Map of Indigenous Chickens in Zambia

The value or marketing chain for indigenous chickens in Zambia is simple and under developed with no infrastructure at all save for some market stalls in the urban trading centres in Lusaka and other major towns. The main actors along this value chain are smallholder farmers, primary collectors and live bird traders and agents, wholesalers and retailers. The main marketing channels are from farmer to trader or consumer (informal marketing). The other marketing channel is from farmer to retailer and then to consumer (primary marketing). Some farmers sell directly to restaurants while others sell to traders (middlemen) who take their chickens either to secondary markets and urban markets (wholesalers). The final, end market of indigenous chickens is domestic consumption through retailers. Figure 1 shows the indigenous chicken value chain map.

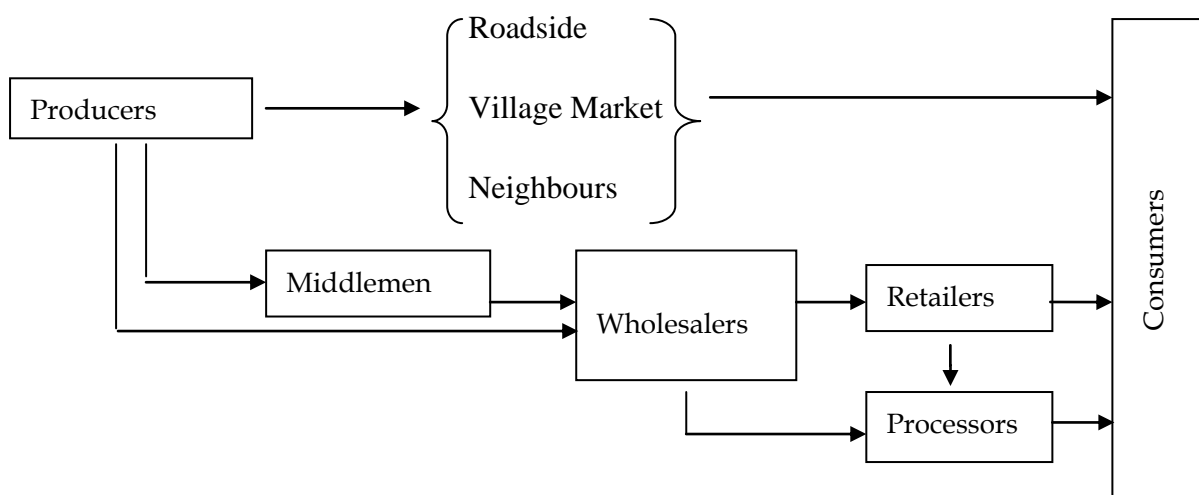


Figure 1. Indigenous chicken value chain map in Zambia

The survey data shows that the majority (32.3 percent) of the indigenous chickens are moved from the producers to consumers through middlemen. The middlemen buy the chickens from

neighboring farmers for sale at nearby markets within the districts or sell to assemblers for a markup. The second most important channel was the roadside (30.3 percent). This was mostly used by those households that are located near the main highways and the targeted markets are the motorists. Local markets such as schools or hospitals account for 20.1 percent while another 13.3 percent are sold through neighbors within the same village either on cash or barter basis.

4.2 Value Chain Actors and Market Chain

4.2.1 Production at Farm Level

Semi-intensive smallholder chicken rearing is a common type of poultry production in the rural areas of Zambia. Indigenous or village chickens freely roam around homesteads and scavenge for food with very little supplementary feeding being provided. The indigenous chickens cause minimal destruction to the environment and require minimal external inputs. Reasons for keeping indigenous chicken are varied and include food security, trading, barter or for quick cash when a domestic need arise as well as fulfilling customary obligations. The survey data shows that almost all the households (99.0 percent) in both Chongwe and Mumbwa districts owned chickens. The data shows that only 43.9 percent of the households reported making attempts at improving their flock type through deliberate breeding programmes. The data further shows that ownership of chicken cuts across all gender; women, men and children owned chickens. However, female-headed households have fewer chickens on average (24) compared to their male counterparts (30). As shown in Table 1, in terms of flock size and composition, an average household tends to have more chicks (16.25) followed by hens (10.3) and cocks (2.6).

Table 1. Average number of Indigenous Chickens owned and Mortality Rates by District

Variable	District	Chicken type		
		Cocks	Hens	Chicks
Flock size	Mumbwa	2.8	10.9	17.5
	Chibombo	2.4	9.7	15.0
	Total	2.6	10.3	16.25
Mortality	Mumbwa	1.04	2.52	10.16
	Chibombo	0.44	0.94	7.93
	Total	0.74	1.73	9.05

Furthermore, the data shows that mortality is quite high among chicks (9.05) followed by hens (1.73) and cocks (0.74). The limited rearing of indigenous chickens in large numbers could be attributed to their slow growth rates; poor egg production, high mortality rates and susceptibility to diseases. The major disease that severely affects indigenous poultry production is Newcastle Disease (ND), the highly infectious viral disease. The extremely high mortalities reported for ND is a major factor that discourages peasants from investing much of their time and scarce resources in expanding flock size. At the production level, usage of improved technologies for producing indigenous chicken is very low. Most producers have

not been exposed to any modern technologies that could raise productivity. Basic poultry housing among respondents in the villages surveyed was generally absent. Some of the respondents shared accommodation with chickens except in some cases where they have built separate housing for the chickens. The food resources of indigenous chickens consisted of herbs or cereal seeds, insects which the birds scavenge with very little supplementary feeding provided by the owners.

There is a general lack of extension and veterinary services in most rural areas and consequently producer knowledge of methods of disease prevention and breeding practices is quite low. About almost 92% of the respondents mentioned that their indigenous chickens have suffered clinical symptoms consistent with Newcastle Disease (ND) and or Infectious Bronchitis (IB). Farmers are still using traditional herbs for prevention of diseases while chickens are housed in unconventional houses that expose them to adverse weather elements such as rainfall and cold leading to high mortality and seasonality of production. Despite this, most of Zambia's rural population lives in areas where the indigenous chicken is best adapted to the harsh living conditions. It is speculated that with minimal technical and institutional support, the indigenous chicken could contribute significantly to the agricultural economy and could curtail the vicious cycle of poverty and poor human nutrition.

4.2.2. Marketing at Farm Gate

As mentioned above, most households rear indigenous chickens as part of their livelihood strategy. The survey results show that the main reasons for keeping chickens included selling (14.6 percent); home consumption (12.7 percent); selling and home consumption (70.1 percent). Only 23.6 percent reported keeping and selling chickens solely for business purposes. For those that reported selling chickens, the main reasons for selling included the need to pay for children's school fees (62.0 percent) and the need to pay medical bills (13.9 percent). The majority of the households (96.2 percent) reported having sold an indigenous chicken. However, although most of the households reported selling chickens, sales were quite low (Table 2) with only 17 households reporting selling chickens on a weekly basis. Even among those who sold, the levels of sales were low (with 88.2 percent selling less than 5 chickens per week). Similarly, consumption of chickens was quite low among these households. Only 17.1 percent reported consuming a chicken once a week, whereas the majority (86.0 percent) consumed a chicken monthly

Table 2. Frequency of Selling Chickens

Time frame	No of chickens sold	Frequency	Percentage
Weekly	0 to 10	15	88.2
	11 to 15	-	-
	More than 16	2	11.8
Monthly	0 to 10	149	84.2
	11 to 15	23	13.0
	More than 16	5	1.7

The marketing system for indigenous poultry is a simple one, involving a number of market

intermediaries who take possession of the poultry before passing on the birds to the retailers or consumers. The prices obtained for the chickens by the farm household were also dependent on the channel used. For instance, data from the producer household interviews (Table 3) shows that on average, those that sold through producer groups received the highest prices for both cocks and hens (K32 273 and K24 091 respectively) while those that sold to neighbors got the lowest prices (K28 816 and K20 615 respectively)¹.

Table 3. Marketing channel used by Price received

Outlet/Channel	Average prices received per chicken sold (Zambian Kwacha)			
	Cocks	Hens	Chicks	Average (hens & cocks)
Middlemen/Assemblers	30 705	23 105	9 349	27 226
Neighboring markets	30 729	22 847	8 897	26 788
Neighbors	28 816	20 615	8 000	24 750
Producer groups	32 273	24 091	11 000	28 181
Roadside	30 618	23 191	10 138	26 904

4.2.3 Wholesaling/Assembling

Table 4 presents a summary of costs incurred during the assembly process. Based on the data from the assemblers/wholesalers, the average cost of an indigenous chicken at the farm level (average for cocks and hens) was K22 933. This figure is lower than the average reported as the selling price from the producer household survey (K27 226) in Table 3. For the sampled wholesalers, the average number of chickens assembled per trip was 79 while a trip lasted six days on average. The average spent on food and accommodation during this process was K34 200 per day or K2 579 per chicken bought. The cost of transportation to the roadside was quite minimal (K77 per chicken). The assemblers paid an average of K1 322 on the trucks to move the chickens to Lusaka, in addition to council levies along the road which averaged to about K1 566 per chicken. Other costs incurred are shown in Table 4. When these chickens are landed in Lusaka, they are either sold in bulk to other retailers at wholesale prices or sold apiece at retail prices to individual consumers who prefer to buy directly from wholesalers as they tend to be slightly cheaper than the retailers. The average wholesale (bulk purchase) price (hens and cocks) was reportedly K33 133 per chicken while the average retail price (for those who buy one chicken) was K36 633 regardless of whether they purchased directly from farmers or assemblers/middlemen.

Table 4. Marketing Costs from Farm gate to the Wholesale markets

Activity	Purchasing from farmers		Purchasing from local assemblers	
	Average cost (K)	Share (total cost)%	Average cost (K)	Share (total cost) %
Chicken cost	22 933	75.3	27 226	84.68
Assembly costs	2 579	8.47	0	0%
Local transport	77	0.25	77	0.24
Counsel levies	1 566	5.14	1 566	4.87

¹ At the time of the study, the Zambian Kwacha/United States Dollar exchange rate was K5 000/US\$1

Transport to Lusaka	1 322	4.34	1 322	4.11
Market fees	300	0.99	300	0.93
Loss in transit/storage	1 661	5.45	1 661	5.17
Total Cost	30 448		32 152	
Selling price (Wholesale)	33 133		33 133	
Selling price (retail)	36 633		36 633	

4.2.4 Retailing

Retailers are another important component of the indigenous chicken value chain. It is through them that the majority of the chickens get to the final consumers, the households. These are usually found in the markets which are scattered around the suburbs and procure the chickens either directly from the farms or from wholesalers at wholesale prices. The costs involved in procuring chickens from the wholesalers to the retail markets include the cost of purchasing the chickens, transportation, market fees, council levy, storage costs as well as losses in transit and during storage. Table 5 presents a summary of the costs associated with marketing of indigenous chickens from wholesale to retail markets. In this table, the chicken cost is based on the average prices computed for wholesale selling price (K33 133).

Table 5. Marketing Costs faced by retailers from Wholesale to Retail markets

Marketing Activity	Average cost (Zambian Kwacha)	Share to total cost
Chicken cost	33 133	92.7%
Transportation	1 460	4.1%
Market fees	102	0.3%
Losses in transit/storage	1 047	2.9%
Total costs	35 742	
Selling price	38 979	

4.2.5 Processing

Although restaurants only accounted for a small proportion of indigenous chicken marketed, they are an important segment of the value chain as they are the only ones adding value through processing. For this study, 30 restaurants were included in the sample drawn from low income (33.3 percent); medium income (50.0 percent) and high income (16.7 percent) areas. The low income areas within Lusaka included Garden, Chaisa and Chilulu compounds; the medium income areas included Kabwata, COMESA and Town Center markets while the high income area was Thornpark. Of the sampled restaurants, 60 percent served indigenous or village chicken to their clients. Furthermore, the survey data shows that the income category served had a bearing on whether a restaurant served indigenous chicken with those restaurants catering for the medium and high income categories tending to serve more indigenous or village chicken compared to those catering for low income category (Figure 2).

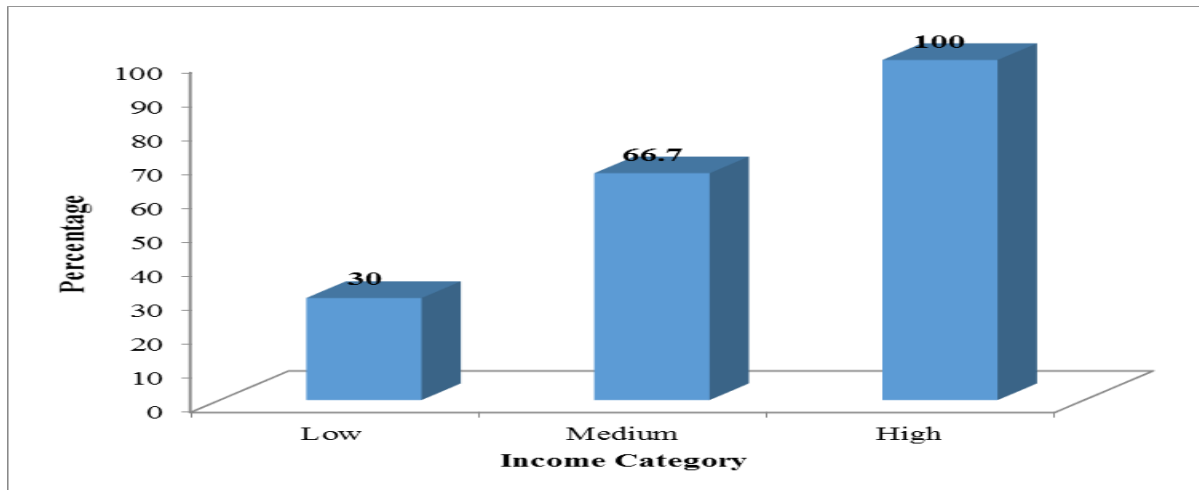


Figure 2. Percentage of Restaurants serving Indigenous Chicken by Income Category

Figure 3 shows the percentage preferences by type of chicken in the three restaurant types. Overall, it was reported that indigenous chicken is much preferred (53.3 percent) compared to broiler chicken (46.7 percent). However, the overall picture masks the income-related differences. When disaggregated, the data showed that among the restaurants catering to the low income groups, broiler chicken is more preferred (80 percent) compared to indigenous chicken (20 percent). However, the trend is reversed as the income catered for increases. This implies that preference for indigenous chicken is related to income, which is not surprising considering that indigenous chicken is more expensive compared to broiler chicken.

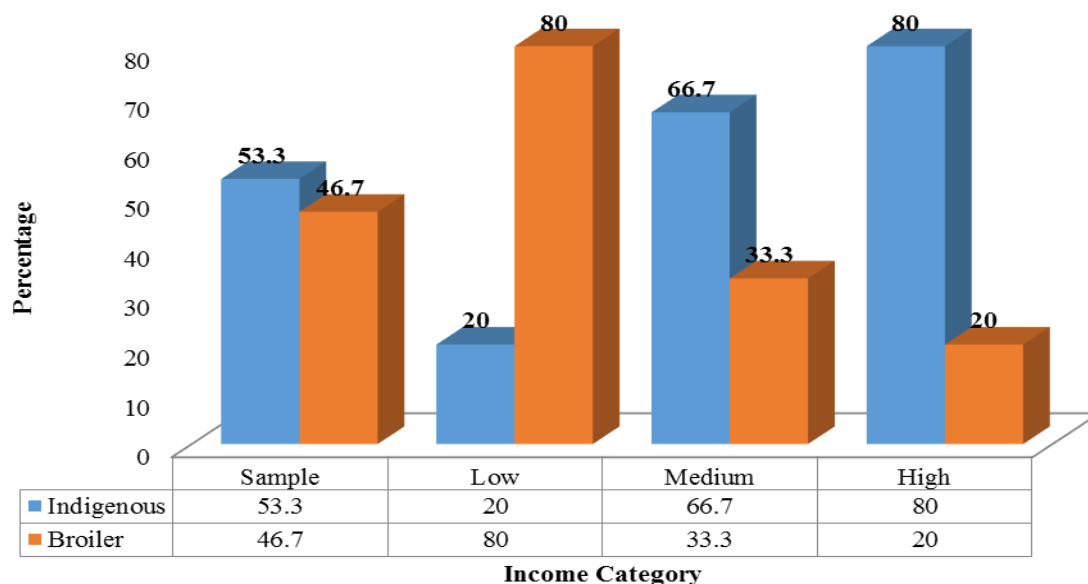


Figure 3. Chicken preference in Restaurants by Income category

Table 6 shows a price comparison between meals of indigenous chicken and broiler chicken served with *nshima* per plate, and the number of plates served from one chicken and how much money is realized from one chicken in some restaurants². The assumption made in

² *Nshima* a semi-soft to hard porridge cooked using maize meal which is usually eaten with an accompaniment

making the comparison is that the cost of preparing *nshima* is the same for both types of chicken. However, there is likely to be slight variations in terms of costs incurred in preparing the two types of chicken. Since indigenous chickens are purchased live from retailers and have to be slaughtered and dressed, it takes more time to prepare. On the other hand, whereas some restaurant owners prefer to purchase live broiler chickens, most of them procure dressed ones and hence incur less costs in terms of preparation. Furthermore, most broiler chickens are usually served grilled (which is a less costly method of preparing), as compared to indigenous chickens which are usually served as stews (which is more costly). From this comparison as clearly shown in Table 6, restaurants on average make more money when they sell or serve indigenous chicken meals as compared to broiler chicken meals. The average amount raised is computed by multiplying the average number of plates served from one chicken by the average price per plate.

Table 6. Comparison of Prices between Meals serving Indigenous and Broiler chicken

Meal type/Plates served	Sample	Income category catered for		
		Low	Medium	High
Average Price of <i>nshima</i> served with Indigenous chicken (K)	13 367	7 500	13 000	19 600
Average Number of plates served	8	10	8	5
Average Amount of money raised (K)	98 867	75 000	104 000	117 600
Average Price of <i>nshima</i> served with Broiler chicken (K)	10 312	5 835	10 500	14 600
Average Number of plates served	9	12	8	6
Amount of money raised (K)	80 540	70 020	84 000	87 600

In summary, restaurants are the only ones adding value to indigenous chicken through processing. However, the quantities processed are quite small compared to that of live birds sold to most consumers. Indigenous chicken is served in restaurants catering to all income categories, although it is mostly found in those restaurants catering to the high income categories. Compared to broiler chicken, it costs more to procure and prepare. However, the returns per chicken are also much higher than those for broiler as it fetches premium prices. The direct costs incurred during preparation of indigenous chicken include energy, ingredients (cooking oil, onions and tomatoes) and labor. However, these direct costs for preparation were estimated to amount to a maximum of K15 000 per chicken. Based on this estimation, Table 7 shows the estimated costs and prices involved in delivering indigenous chicken to consumers in a restaurant.

Table 7. Marketing Costs from Wholesale to Retail markets

Marketing Activity	Average Cost (Kwacha)	Share to Total Cost (%)
Chicken cost	38 979	72.2
Processing	15 000	27.8
Total costs	53 979	
Selling price	98 867	

of vegetables and/or livestock products. *Nshima* is Zambia's staple food and is commonly served in homes and restaurants.

4.2.6. Consumers

Demand for indigenous chicken, especially among the affluent, is very high because of its low fat content compared to broiler chicken. The demand for indigenous poultry in Zambia can be divided into two major segments, urban and rural. The urban segment of the indigenous chicken market comprises of Lusaka and Copperbelt. According to Haazele *et al.* (2002), there are several segments that can be identified within this urban market. These include (i) the high income groups, (ii) medium income groups, (iii) low income groups, and (iv) restaurants and lifestyle consumers. For the purposes of this value chain analysis, we concentrate on the high income, middle income, low income and restaurants.

4.3 Consumption of Indigenous Chicken (analysis of end-market preferences)

The majority of the households (87.7 percent) reported consuming indigenous chicken. Furthermore, the data shows that households consumed more broiler chicken (3.36 times per month) than indigenous chicken (2 times per month). Low income households (Figure 4) consumed more indigenous chicken per month on average (2.34 times) compared to high income households (1.9 times).

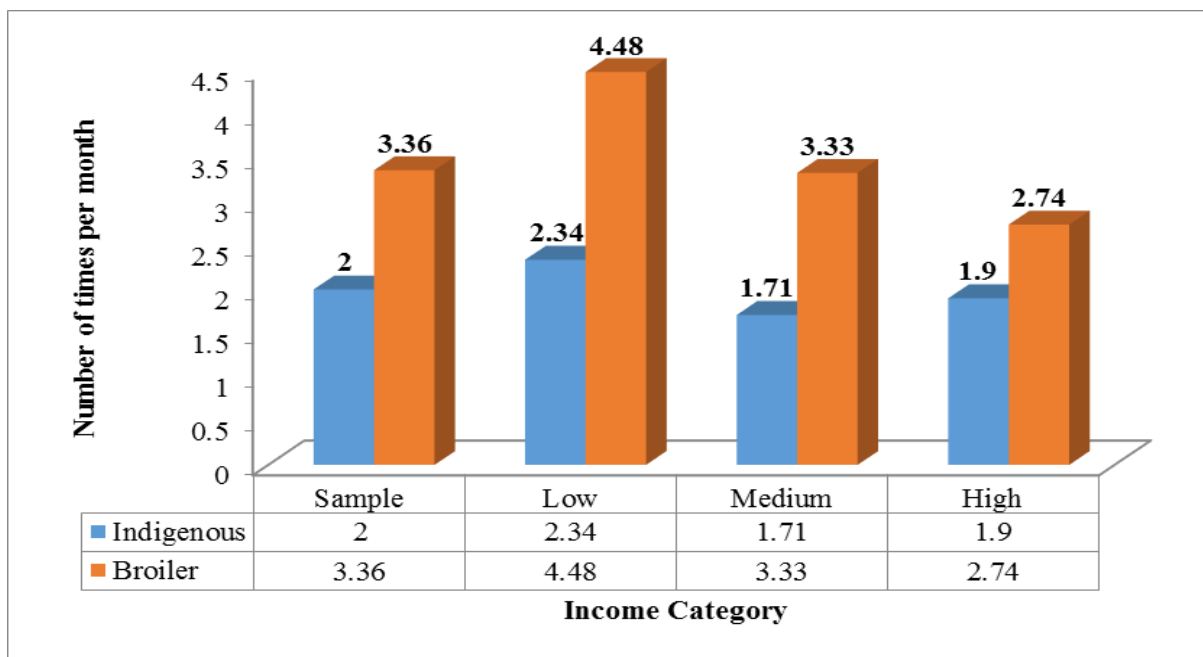


Figure 4. Consumption of chicken by chicken type and income category

For those that did not consume indigenous chicken, among the reasons given included non-availability (29.8 percent), not easy to prepare³ (19.3 percent) and high cost (14.0 percent) among others. Considering that availability was the main reason for not consuming indigenous chicken, the respondents were asked to provide information about where they sourced the chickens from. The survey data shows that whereas broiler chicken, which is consumed more often, is found in open-markets (53.1 percent), supermarkets (22.2 percent)

³ Preparation includes slaughtering and dressing

and among households who rear in the backyards (18.2 percent), indigenous chicken is mostly found in open markets (87.1 percent) and farms (12.9 percent) making it difficult to access. The other aspect related to availability was price. On average, indigenous chicken was more expensive (K34 247) compared to broiler chicken (K26 354). Similarly, there were more consumers that perceived indigenous chicken as being very expensive (67.9 percent) compared to those that perceived broiler chicken as being very expensive (32.1 percent). Figure 6 is a comparison between prices of indigenous chicken and its closest competitors (broiler chicken, beef and fish). The results show that indigenous chicken costs more than broiler chicken and fish per kilogram. However, beef costs more than indigenous chicken per kilogram.

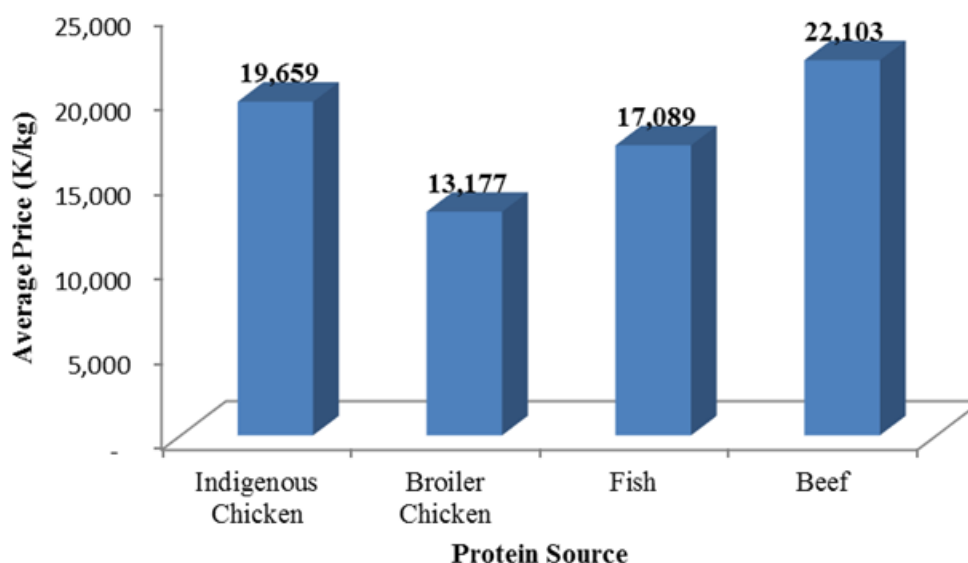


Figure 6. Comparison of prices/kg between indigenous chicken and its competitors

In terms of preferences at household level, indigenous chicken was more preferred (52.5 percent) compared to broiler chicken (40.8 percent), a pattern that was consistent even across income categories. Comparison of attributes of chicken (Table 8) shows that broiler scores high on price (75.9 percent) as opposed to indigenous chicken (13.7 percent). Similarly, broiler chicken scored high on availability (93.5 percent) compared to indigenous chicken (27.3 percent). However, indigenous chicken scored highly on taste (98.6 percent) as opposed to broiler (44.4 percent).

Table 8. Reasons for preference by Chicken type

Reason	Chicken type	Number	Percentage
Price	Broiler	82	75.9
	Indigenous	19	13.7
Availability	Broiler	101	93.5
	Indigenous	38	27.3
Good taste	Broiler	48	44.4
	Indigenous	137	98.6
Sale by pieces	Broiler	60	55.6
	Indigenous	4	2.9

For those that purchased indigenous chicken, the majority (35.9 percent) cited health reasons, followed by good taste (35.1 percent) and size (12.9 percent). Only a few (5.8 percent) mentioned availability and affordability (4.4 percent) as the reasons for purchasing indigenous chicken. Similarly, those that did not consume indigenous chicken cited non-availability (32.3 percent); high cost (29.0 percent) and inconvenience of slaughtering and dressing (16.1 percent) among others as the reason for not consuming indigenous chicken. However, the data shows that indigenous chicken is consumed across all households, although not in similar proportions as broiler. Among the reasons why households do not consume indigenous chicken include not being available in formal outlets such as supermarkets, high cost as well as inconveniences faced due to the fact that indigenous chicken is sold live and has to be slaughtered and dressed.

4.4 Value Chain Analysis

The following section sums up preceding sections by giving a detailed value chain analysis of indigenous chickens from production to consumption (detailed costs from production, wholesaling, retailing and processing) are also provided while the margins accruing to the different players along the chain are also provided.

4.4.1 Margins from Production to Retail Level (Live Indigenous Chickens)

Figure 8 shows the costs from production to retail and also the margins accruing to the different players. Assuming zero cost of production while a chicken costs K22 933 at the farmgate (based on the reported cost of chicken by wholesalers when they purchase directly from farmers), the farmer gets the most in terms of gross margins (100 percent). The assemblers get the second highest margins (44.5 percent) as they purchase at K22 933 and sell at K33 133 while retailers get the least (17.6 percent). However, it is worth emphasizing that these are gross margins which ignore the costs incurred in the process by the assemblers and retailers.

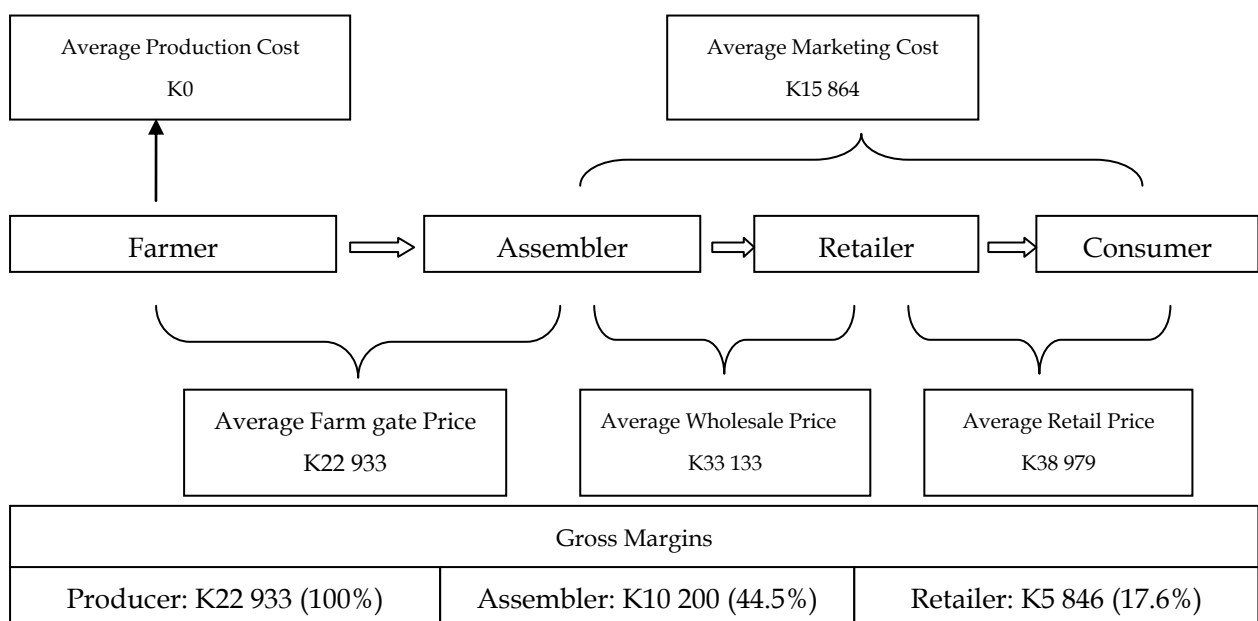


Figure 8. Value Chain Analysis

4.4.2 Margins from Processing to Consumption level (Restaurants)

As earlier indicated, the costs at processing include the cost of purchasing the chicken, labor cost of preparing (i.e. slaughtering, dressing, cooking as well as serving) and cost of ingredients (tomatoes, onions, oil and energy for preparing). The results from the survey of the processors (mainly restaurants) showed that the following are the costs and margins obtained:

- Average cost of purchase: K38 979
- Average cost of processing: K15 000
- Total cost of (chicken + processing): K53 979
- Selling price K98 867
- Margin= K44 888 (83.2 percent)

Other than the producers who are assumed to almost get 100 percent margins from the enterprise (because it is assumed that they incur zero cost of production), processors get the next highest margins (83.2 percent)⁴ followed by the assemblers (44.5 percent). In conclusion, it is worth noting that across the value chain, all the players get positive gross margins with the farmers getting the highest followed by processors.

4.5 Analysis of the Environment

In terms of enabling environment, agricultural policies in Zambia have been highly biased towards maize production with the aim of ensuring food security. For instance, the Farmer Input Support Programme (FISP), a programme under which fertilizers and maize seed are distributed to farmers for maize production, has always accounted for about 40 percent of the total agricultural budget (Government of the Republic of Zambia, 2004). Similarly, extension delivery has been tailored towards maize production at the expense of other crops and livestock. However, in the Sixth National Development Plan (SNDP) for the period 2011-2015, there is a change in the policy direction with livestock development earmarked to receive significant attention and budgetary allocations (Government of the Republic of Zambia, 2010).

The low emphasis that small-livestock has received from policy-makers and other agencies supporting agriculture is manifest through low levels of trainings received by the households on techniques of indigenous chicken production. The household survey data shows that only 13.5 percent of the households reported having received any training on indigenous poultry production. Of those that received these trainings, these were provided by government extension workers (52.4 percent) and Non-governmental Organizations (47.6 percent). Furthermore, although a good proportion of the farmers (66.3 percent) said they had sufficient knowledge levels on good feeding practices, only 33.3 percent reported having sufficient knowledge on disease control methods and only 22.8 percent reported having sufficient knowledge on breed improvements. This is likely to have contributed to the observed low production for indigenous chicken.

⁴ This margin is computed by dividing the margin (the difference between the selling price for processed chicken (98.867) and the total cost (which is the cost of the chicken plus the processing cost) by the total cost

Indigenous chicken production does not require much capital. All a farmer needs is to buy a hen, build a crib using local materials and all is done. However, for wholesalers, they require some minimum level of capital for them to engage in the business. For this sample, the average amount of capital required to get into the indigenous retail business was K511 379 while the maximum was K1 200 000 and the minimum was K70 000. However, regardless of the relatively little amounts of money required to start the business, only a few wholesalers reported accessing loans (10.0 percent from microfinance institutions and 6.7 percent from friends and other private sources). Among the retailers, 36.6 percent reported having access to credit. The major consequence of lack of credit (as reported by those who did not have access to credit) was inability to expand their businesses.

5. Conclusions and Recommendations

Based on the findings, it can be concluded that although the majority of smallholder households keep indigenous poultry, this is considered as a part-time activity with only a few, if any, that are keeping indigenous poultry on commercial basis. Furthermore, productivity and production is very low leading to low and unplanned sales at the farmgate level. However, looking at the differences between the minimum and the maximum production, and considering that it is a low input activity, potential for growth exists. The indigenous poultry value chain mainly consists of producers, assemblers/wholesalers and retailers. However, the absence of processors along the chain means that chickens are sold live and consequently cannot be retailed through formal channels like supermarkets leading to exclusion of potential customers in the middle and high income categories who normally shop from supermarkets. Furthermore, as population and incomes grow, demand for indigenous chicken is likely to continue growing, especially among the high income groups who not only prefer it for its taste, but also for health reasons due to its low fat content. Finally, although the value chain for indigenous chicken shows positive gross margins for all the players along the chain, there is need to address the various constraints affecting the value chain for indigenous chickens in order to improve the operation of the chain and hence lead to increased incomes for the value chain actors and at the same time ensuring cheap delivery of indigenous chicken in a more convenient form and in formal outlets.

Capacity development on improved production methods (i.e. proper housing, provision of medications and supplementary feeding) of indigenous chicken through extension programs targeting producers can profoundly improve the growth, profitability and income opportunities for a large number of farm households (over 90 percent) who are engaged in indigenous chicken production, and provide employment to those involved in the marketing process. Moreover, unlike its closest competitor (broiler), the current marketing system for indigenous chickens is very rudimentary making it impossible for the product to enter the modern marketing system such as supermarkets. One way in which this can be addressed is to increase access to finance both at the production level (leading to increased production) and the marketing level (leading to improved services). Microcredit institutions could assist some of the farmers and traders with credit so that they could then be able to procure larger quantities and process (i.e. slaughter, dress and package) the chickens into a form that can be stocked in modern supermarkets.

Supporting value addition activities along the marketing chain such as slaughtering, dressing and packaging the indigenous chickens in such a way that they can be sold in formal retail outlets such as supermarkets can not only assist to bring the product closer to consumers but also provide it in a more convenient form for urban households and hence increasing demand. Furthermore, this is likely to reduce the cost of storage, as currently the chickens are stored live and have to be fed leading to losses. Better storage facilities would also ensure a more steady supply as dressed processed chickens can be kept in cold storage hence avoiding seasonality of supply.

Acknowledgement

This study received financial support from the African Economic Research Consortium (AERC).

References

- Asem-Bansah, C. K., Sakyi-Dawson, O., Ackah-Nyamike, E. E., Colecraft, E. K., & Marquis, G. S. (2012). Enhancing backyard poultry enterprise performance in the techiman area: A value chain analysis. *African Journal of Food, Agriculture, Nutrition and Development*, 12(1), 5759-5775. [Online] Available: <http://www.ajol.info/index.php/ajfand/article/view/74830/65428>
- Asia Dhrra. (2008). Value Chain Analysis Report, Cambodia, Philippines and Vietnam: Linking Small Farmers to Markets Project Asia Partnership for Development for the Human Resources in Rural Asia. [Online] Available: <http://asiadhrra.org/activityblogs/2ndlsfmrw/lsvmvaluechain2.pdf>
- Disaster Management and Mitigation Unit (DMMU) (2008). Situational Analysis Report, 2007. Office of the Vice-President. Lusaka, Zambia
- Dolberg, F. (2003) A Conceptual Framework For Using Poultry as a Tool in Poverty Alleviation [Revised version] presented at Staying Poor: Chronic Poverty and Development Policy, Institute for Development Policy and Management, University of Manchester, 7-9 April 2003. Chronic Poverty Research Centre (CPRC), Manchester, UK. [Online] Available: http://r4d.dfid.gov.uk/PDF/Outputs/ChronicPoverty_RC/AskovJensen.pdf
- Dolberg, F. (2004). Review of household poultry production as a tool in poverty reduction with focus on Bangladesh and India. In V. Ahuja, (ed). *Livestock and livelihoods: challenges and opportunities for Asia in the emerging market environment*. India, National Dairy Development Board, and Rome, FAO, Pro-Poor Livestock Policy Facility (South Asia Hub).
- Dolberg, F. (2008). Poultry production for livelihood improvement and poverty alleviation. In *Proceedings of the International Conference Poultry in the Twenty-first Century: Avian Influenza and Beyond*. Proceedings of an International Poultry Conference, Bangkok, November 2007. [Online] Available: <ftp://ftp.fao.org/docrep/fao/011/i0323e/i0323e.pdf>
- Government of the Republic of Zambia (GRZ) (2004). National Agricultural Policy, 2005-2015. Ministry of Agriculture and Cooperatives (MACO) [Online] Available:

http://www.gafspfund.org/sites/gafspfund.org/files/Documents/5.%20Zambia_strategy.pdf

Government of the Republic of Zambia (GRZ) (2010). Sixth National Development Plan 2011-2015. Ministry of Finance and National Planning (MoFNP) [Online] Available: http://siteresources.worldbank.org/INTZAMBIA/Resources/SNDP_Final_Draft__20_01_2011.pdf

Haazele, F., Maimbo, F., Lungu, D., & M. Musukwa (2002). Improving the productivity and marketing of free range village chicken. Smallholder Enterprise Marketing Programme (SHEMP) Lusaka

Kaplinsky and Morris. (2001). A Handbook for Value Chain Research, IDRC [Online] Available: <http://www.prism.uct.ac.za/papers/vchnov01.pdf>

King'ori, A. M., J. K. Tuitoek, H. K. Muiruri & A. M. Wachira (2003). Protein requirements of growing indigenous chicken during the 14-21 weeks growing period, *S. Africa J. Anim. Sci.*, 33, 78-82. <http://dx.doi.org/10.4314/sajas.v33i2.3759>

Lubungu, M., Chapoto, A., & Tembo, G. (2012) Smallholder Farmers Participation in Livestock Markets: The Case of Zambian Farmers. Working Paper 66. Indaba Agricultural Policy Research Institute (IAPRI). Lusaka, Zambia. [Online] Available: http://www.iapri.org.zm/index.php/downloads/doc_view/237--wp66smallholder-farmer-participation-in-livestock-marketspdf-?tmpl=component&format=raw

Mack, S., Hoffmann, D., & Otte, J. (2005). The contribution of poultry to rural development. *World's Poultry Science Journal*, 61(1), 7-14. <http://dx.doi.org/10.1079/wps200436>

Magothe, T. M., Okeno, T. O., Muhuyi, W., & Kahi, A. K. (2012). Indigenous chicken production in Kenya: I. Current status. *World's Poultry Science Journal*, 68(01), 119-132. <http://dx.doi.org/10.1017/s0043933912000128>

Mathuva S. (2005). Value Chain Analysis of Indigenous Poultry Sub-sector, Kilifi and Kwale Districts. Kenya Coastal Rural Support Programme, Kenya. [Online] Available: <http://www.value-chains.org/dyn/bds/docs/515/Aga%20Khan%20Kenya%20Poultry%20VCA%202005.pdf>

Moreki JC & Dikeme R. (2011). Small livestock, food security, nutrition security and HIV/AIDS mitigation. [Online] Available: http://www.intechopen.com/download/pdf/pdfs_id/22357

Mutenje, M. J., Mapiye, C., Mavunganidze, Z., Mwale, M., Muringai, V., Katsinde, C. S., & Gavumende, I. (2008). Livestock as a buffer against HIV and AIDS income shocks in the rural households of Zimbabwe. *Development Southern Africa*, 25(1), 75-82 <http://dx.doi.org/10.1080/03768350701837754>

Ngosa, M. (undated) A Report on the Poultry Industry in Zambia. [Online] Available: <http://www.sapoultry.co.za/pdf%20sadc/POULTRY%20INDUSTRY%20IN%20ZAMBIA.pdf>

Okello, J. J., Gitonga, Z., Mutune, J., Okello, R. M., Afande, M., & Rich, K. M. (2010). Value chain analysis of the Kenyan poultry industry: The case of Kiambu, Kilifi, Vihiga, and Nakuru Districts. HPAI Working Paper 24. Washington, DC: IFPRI. [Online] Available: <http://www.ifpri.org/publication/value-chain-analysis-kenyan-poultry-industry>

Perry, B. D., Randolph, T. F., McDermott, J. J., Sones, K. R., Thornton, P. K. (2002). Investing in animal health research to alleviate poverty. 148p. Nairobi (Kenya): ILRI. [Online] Available: <http://books.google.com/books?id=54hL44LMXsYC>

Pica-Ciamarra U., & J. Otte. (2010). Poultry, Food Security and Poverty in India: Looking beyond the Farm-gate. *World's Poultry Science Journal*, 66(2), 309-320. <http://dx.doi.org/10.1017/s0043933910000358>

Simainga S, Banda F, Sakuya N, & Moreki J. C. (2010). Health management in village poultry in Kalabo and Mongu Districts in the Western Province of Zambia. *Livestock Research for Rural Development*. Volume 22 (9), [Online] Available: <http://www.lrrd.org/lrrd22/9/sima22171.htm>

Simainga, S., Moreki, J. C., Banda, F., & Sakuya, N. (2011). Socio-economic study of family poultry in Mongu and Kalabo Districts of Zambia. *Livestock Research for Rural Development*, 23(02). [Online] Available: <http://www.lrrd.org/lrrd23/2/sima23031.htm>

Songolo, A., & J. C. Katongo (2001). Country Report: Zambia. In R.G. Alders, & P.B. Spradbrow, eds. SADC planning workshop on Newcastle disease control in village chickens. Proceedings of an international workshop, Maputo, Mozambique, 6-9 March 2000. ACIAR Proceedings No. 103, pp. 43–45. Canberra, ACIAR.

Sudarman, A., Rich, K. M., Randolph, T., & F. Unger. (2010). Poultry value chains and HPAI in Indonesia: The case of Bogor. HPAI Working Paper 27. Washington, DC: IFPRI. [Online] Available: <http://www.ifpri.org/publication/poultry-value-chains-and-hpai-indonesia>

Yambayamba, E. S. K., & M. N. Musukwa. (2007). Evaluation of Local Chickens for increased Productivity among smallholder producers in Zambia. Department of Animal Science, University of Zambia, Lusaka, Zambia.

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