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Profitability and Financial Efficiency of Small-Scale Indigenous Chicken Egg Producers in Kenya

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Abstract

This study examined the profitability and financial efficiency of small-scale indigenous chicken egg farmers. Farm-level data were analyzed using descriptive statistics and farm budget models. Results revealed that small-scale indigenous chicken egg enterprises were profitable, as indicated by the average net farm income and percentage profit measures. However, farmers were far from efficient in using financial resources, with the majority operating within the marginal efficiency levels. The cost structure indicated that feeds, day-old chicks, transportation, and water usage were the critical cost items accounting for more than 80% of the production cost.

Keywords: Indigenous chicken, egg production, financial efficiency, profitability, small-scale

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Introduction

Poultry is the most abundant livestock species in Kenya, and indigenous chickens are the most popular, with other poultry species constituting 25% of the current total estimated population of 32 million birds (MOLD, 2015). Over the years, the poultry sector has become an essential livestock enterprise (Nyaga, 2007; Graduate Farmer, 2017). Despite the lack of defined or measurable indicators for its contribution to the Gross Domestic Product, Kenya's poultry sector has been recognized as an essential economic tool for rural poverty alleviation and household food and nutrition security (Magothe et al., 2012). The sector is constrained by various challenges, including the high cost of inputs, loss of genetic diversity; low productivity; fluctuations in production and diseases; and poorly organized marketing structures (Graduate Farmer, 2017). The focus here is to examine the profitability and financial efficiency of small-scale indigenous chicken egg farmers and provide practical tools for decision makers and farmers to apply production practices to improve the performance of small-scale indigenous chicken egg production enterprises in Kenya.

Methods

Measures of Farm Profitability and Financial Efficiency

This study investigates the profitability and financial efficiency of indigenous chicken egg farms in Kenya. The analysis assumes a small-scale farm operation with a 200-bird flock, 30-month production period (with the production of eggs starting when the birds are 23 weeks old), 80% egg-laying percentage, 20% mortality rate, 50:50 ratio of personal and borrowed capital at 7% interest rate, and utilizing family labor to manage the day-to-day farm activities. Profitability is measured using net farm income from operations and operating profit margin ratio. Following Doye (2017), financial performance is measured using net farm income from operations and a series of financial ratios, including operating profit margin, operating expense, depreciation expense, farm interest expense, net farm income from operations, and gross and fixed ratios.

Data and Sampling Procedure

Data for the study are from a face-to-face survey of 303 small-scale poultry producers from nine counties: Kiambu, Kilifi, Kirinyaga, Kitui, Lamu, Machakos, Murang'a, Nakuru, and Nyandarua. Farmers were selected using a multistage sampling procedure, which involved identifying a ward in each of the nine counties, purposively selecting four communities from each ward, and, finally, using snowball sampling to select up to 58 small-scale poultry farmers from each county. Before data collection, the questionnaire was pretested in three subcounties (Kasarani, Githunguri, and Makuyu), and the results were used to fine-tune the final questionnaire. The survey, administered between May and July 2019, collected farm-level characteristics and socioeconomic and demographic data of the farm operator. Two hundred eighty-two (93.1%) small-scale farmers (out of the 303 farmers interviewed) indicated rearing indigenous chickens for egg production, and they represent the sample size. All procedures performed involving human participants received IRB

approval. Survey data were supplemented with focus group discussions that offered additional insights.

Results

Descriptive Analysis of Survey Responses

Socioeconomic Characteristics

Survey responses show nearly gender parity among the respondents, with a slight majority (54%) being men, and a majority (60%) of the respondents are below 40 years of age. The study found that 31% of respondents have attained basic primary education, 44.8% have a secondary school education, and 19.8% achieved tertiary education, while 2.5% reported obtaining a university education. Only a small percentage (1.9%) had no formal education. Descriptive statistics show that most of the target population is literate and can be trained on innovations. For marital status, 81.7% of the respondents were married, 16.4% were single, and 1.9% were separated. The responses suggest that the sample farmers have a good family structure that can constitute a stable workforce.

Table 1. Respondents' Socioeconomic Characteristics

Variable	Description	Frequency	Percent
Age	Less than 40 years	168	59.5
	More than 40 Years	114	40.5
Gender	Male	152	53.8
	Female	130	46.2
Education	No formal education	5	1.9
	Primary	87	31
	Secondary	126	44.8
	Tertiary	56	19.8
	University	7	2.5
Marital status	Single	28	9.8
	Married	249	88.3
	Separated	5	1.9
Household head	Male	221	78.2
	Female	61	21.8
Year of experience	Less than 1 year	13	4.7
	1–5 years	49	17.4
	6–10 years	18	6.4
	11–15 years	188	66.8
	Above 16 years	13	4.7

Table 1. (continued)

Variable	Description	Frequency	Percent
Years of residence	More than 1-year	218	77.4
	1-year of residence	28	10.1
	At least 6-month	34	11.9
	Less than 6-month	2	0.6
Other sources of income	Agriculture	212	75.3
	Non-farm related business	44	15.5
	Salaried employment	26	9.2

The study established that most households (78.2%) are male-headed compared to 21.8% female-headed. The majority (77.4%) have lived in the locality for more than one year, 11.9% lived for six months, 10% for one year, and 0.6% had lived in the locality for less than six months. These results show that most farmers in the sample have permanent residents in the study area, a factor that is favorable for poultry farming. When asked about other sources of income, 75.3% of the respondents indicated that they were involved in other agricultural-related activities besides poultry, 15.5% were involved in non-agricultural income-generating activities, and 9.2% were engaged in salaried employment. These findings imply that the majority of the respondents rely on agriculture for household income.

Farm Production, Marketing, and Financing

Figure 1 presents the labor provision for the small-scale indigenous chicken enterprise, indicating that indigenous chicken egg farmers rely primarily on family labor (Figure 1). During the focus group discussions, farmers indicated that the number of chicken kept and returns did not justify hiring workers. It was noted that some farmers combine hired labor for other enterprises like dairy farming to take care of indigenous chicken farming.

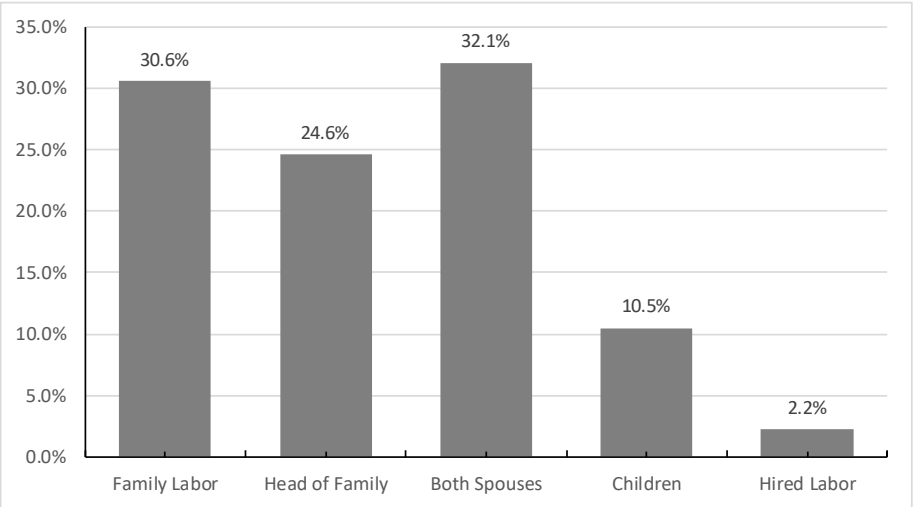

Figure 1. Labour Provision

Table 2 presents a cross-tabulation of the findings on flock size and method of production. Results show that most (54%) of the farmers keep a flock size of 50–100 birds. Focus group discussions indicated that the reasons for keeping chickens dictates flock size. If the reason is for commercial purposes, flock size is usually above 100 birds. However, if the reason is for household consumption, the flock size is typically small, ranging from 10–50 birds. Farmers explained that due to the small size of land, high production costs, and competitions from exotic chicken, especially broilers that mature very fast, the indigenous bird flock size keeps reducing over time.

Table 2. Flock Size and Method of Production

	Intensive Production	**Complete Free-range**	**Semi free-range**	**Total**
1–50	1.0%	11.7%	13.0%	25.7%
50–100	26.7%	8.3%	19.0%	54.0%
100–200	6.3%	4.7%	1.0%	12.0%
Above 200	3.0%	0.0%	5.3%	8.3%
Total	37.0%	24.7%	38.3%	100.0%

The breakdown in Figure 2 shows that farmers use different types of feeds. Leftover food (65.3%), commercial feeds (62%), and kitchen refuse constitute the major feed types. Focus group discussions revealed that animal feed shops are the primary source (62.2%) of purchased commercial feeds and that the majority (86%) of the feeds used are concentrate. Other significant production inputs include veterinary drugs (82.6%), vaccines (63.8%), feeding equipment (57.4%), water (46.8), chemicals (28.5%), and electricity (20.6%). When asked about the survival rate at the farm level, most of the respondents (51.3%) reported rates above 50% (Figure 3).

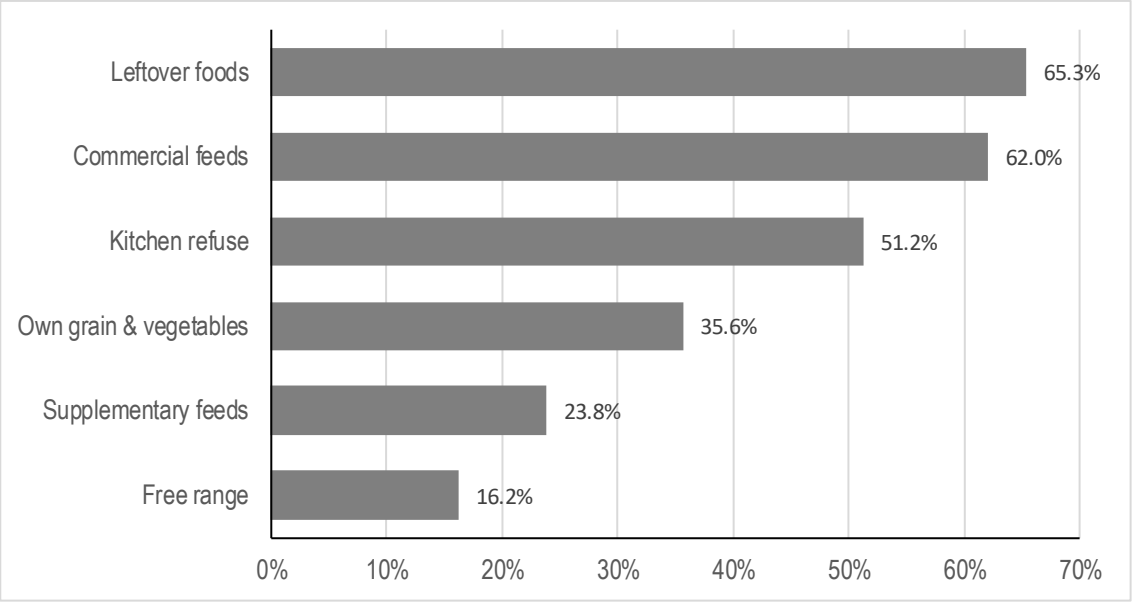

Figure 2. Types of Feeds

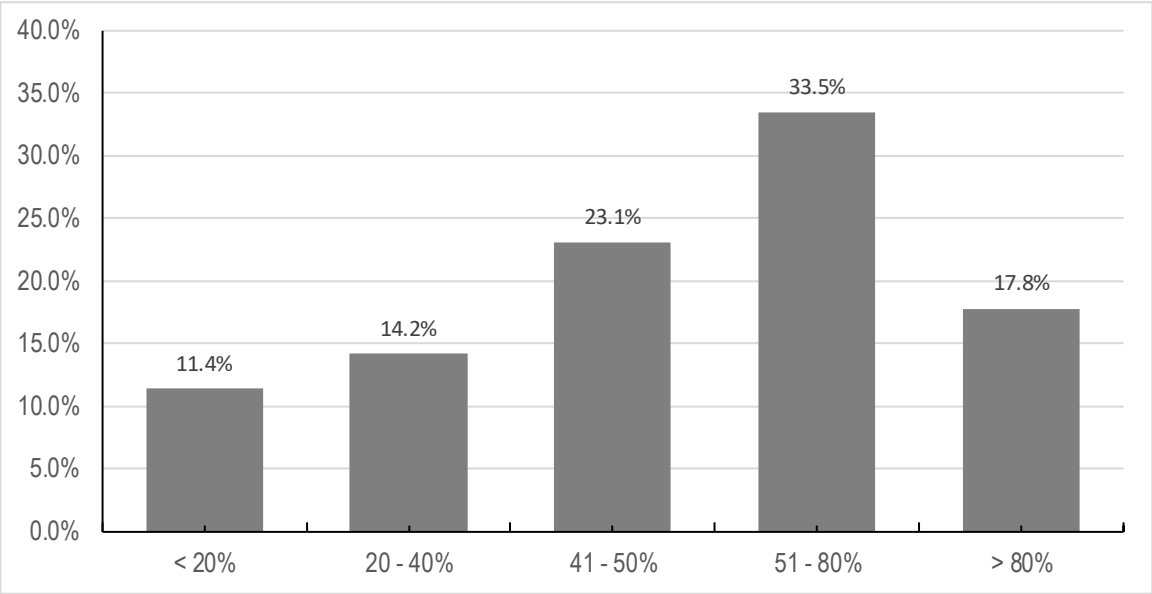

Figure 3. Survival Rate

Table 3: Production Inputs Other Than Chicken Feeds

Variable	Frequency	Percent
Veterinary drugs	233	82.6
Vaccines	180	63.8
Feeding items	162	57.4
Water	132	46.8
Chemicals	80	28.4
Electricity	58	20.6

The breakdown in Figure 4 shows that 92.3% of the sample farmers used personal funds to finance their enterprises, while 71.6% utilized the Table Banking/Merry-go-round scheme. Focus group discussions indicated that though they use their savings and funds from Table Banking, these resources are handily enough to fund large-scale chicken farming above 400 birds. It is worth noting that only 7.4% of the respondents sourced funds from commercial banks. The low usage of commercial banks could be attributed to the high cost of commercial loans. Farmers also confided that they avoid getting commercial loans to avoid losing their collateral in case of default. In terms of sales outlets, Figure 5 shows that eggs were sold mainly at the farm gate (65.5%) and through retail arrangements (62/4%).

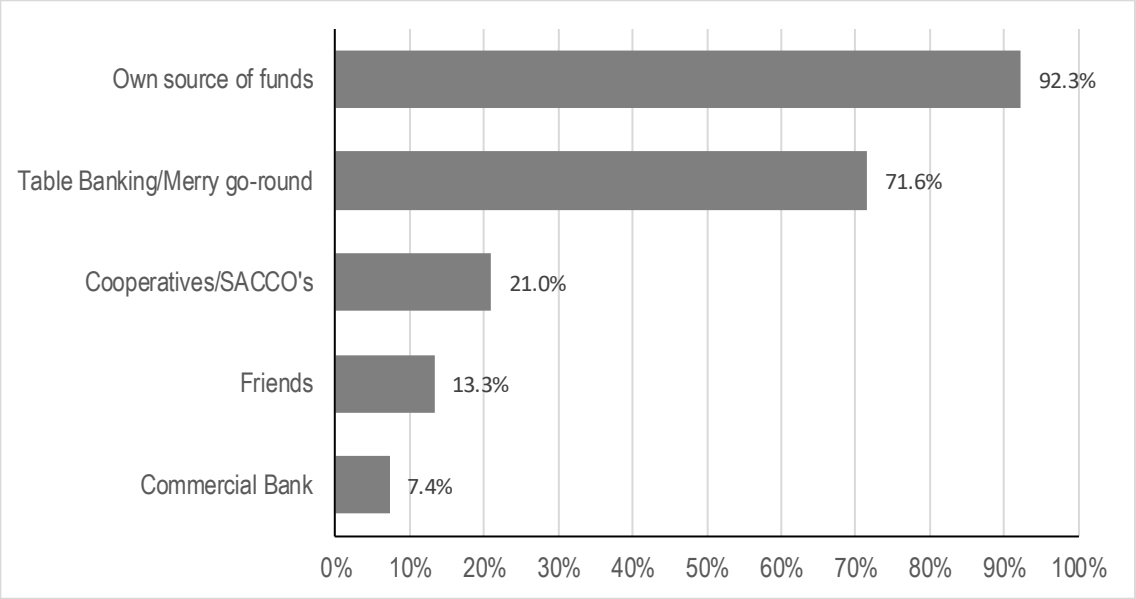

Figure 4. Source of Finances

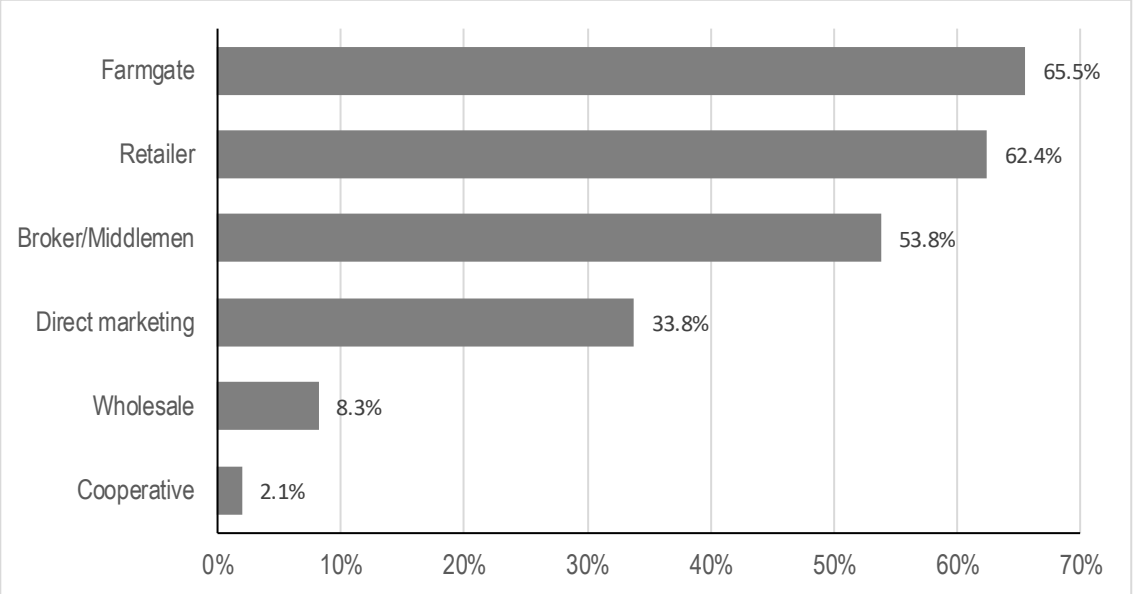

Figure 5. Marketing outlets

Profitability and Financial Efficiency Results

This section focuses on the cost associated with indigenous chicken egg farming and the revenue that accrues to the farmers. The results presented in Table 4 indicate that feed costs accounted for about 82.6% of the total production cost. This finding is not surprising given that feed costs have always been high in the poultry sector (Anang, 2013; Tanko et al., 2014; Mere, Ater, and Ezihe, 2017). As previous studies have noted, feed costs are the determinant of efficiency and profitability

as they account for a substantial portion of total production cost (Haruna and Hamidu, 2004; Kalla, 2007; Hassan et al., 2011). Overall, variable costs account for 89.6% of the total production cost. An average of KSh. 1,971,200 accrues to a farmer as revenue and KSh. 480,760 as gross margin.

Table 4. Cost and Returns of Small-Scale Indigenous Chicken Egg Farms in Kenya

	Average cost of Production	**% Share of Cost**
Variable Expenses		
Day-old chick	20,000.00	1.20
Feeds	1,373,440.00	82.57
Water	50,000.00	3.01
Brooding*	9,000.00	0.54
Drugs and Vaccines	5,000.00	0.30
Veterinary services	3,000.00	0.18
Transportation*	30,000.00	1.80
Total Variable Cost	1,490,440.00	89.60
Fixed Expenses		
Housing	100,000.00	6.01
Equipment	6,650.00	0.40
Interest on Loan (KSh. 833649) @ 7%*	58,355.43	3.51
Depreciation	7,998.70	0.48
Total Fixed Cost	173,004.13	10.40
Total Expenditure	1,663,444.13	100.00
Returns		
Gross income	1,971,200.00	
Gross margin	480,760.00	
Net farm income from operations	307,756	
Operating profit margin ratio	0.125	
Production efficiency = ATR/ATC	1.19	
Percent profit	18.50	
Operating expense ratio	0.81	
Depreciation expense fatio	0.004	
Interest expense ratio	0.030	
Net farm income from operation ratio	0.156	
Gross ratio	0.84	
Fixed ratio	0.09	

Note: ATR/ATC: Average total revenue/Average total cost
* represent information drawn from secondary sources

The average net farm income from operations of KSh. 307,756 and percentage profit of 18.5% show that indigenous chicken egg farming is a profitable enterprise in the study area. All things

being equal, farmers should be able to pay back loans even at a commercial bank interest rate (hypothesized at 7%) as indicated by a low-interest expense ratio of 3%. The production efficiency index indicates that returns exceed costs by 19%.

Furthermore, the operating expense ratio is estimated at 81%, which puts the average indigenous chicken egg farm within the marginal efficiency level. As noted by Doye (2017), rates in the 40% to 60% range indicate relatively efficient operations, with efficiency declining as the ratio rises. Ratios in the 60% to 75% range would reflect average efficiency, while 75% or larger rates would reflect marginal efficiency. The estimated ratio of 81% indicates that about 20% of gross farm revenue is available to replace depreciable assets, make all interest and principal payments on real assets, and provide a family living. Similarly, the computed gross ratio coefficient of 0.84 implies that 84% of the gross income offset total farm costs. The lower the gross ratio, the higher the return per Kenyan shilling (KSh.) invested. The fixed ratio coefficient is estimated at 0.09, implying that 9% of the gross income covers fixed assets, which indicates that indigenous chicken egg farmers in the study area use fixed resources efficiently. In summary, the results show that all the ratios are less than 1, implying that small-scale indigenous chicken egg farms in Kenya are profitable business enterprises.

Conclusions

The study revealed that indigenous chicken egg enterprises are profitable, as indicated by the gross margin of KSh. 480,760 and a net farm income from the operation of KSh. 397,756. However, the farmers are far from being efficient in using financial resources, as the operating expense ratio showed that the average farm was operating within the marginal efficiency level. As highlighted by the descriptive statistics, the significant constraints include inadequate finance, long chicken maturity, and lack of markets. The cost structure indicated that feed cost, cost of day-old chicks, transportation, and water cost were the most critical cost items accounting for 89% of the production cost.

Acknowledgment

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