Marketing of Broiler Birds under Contract and Non-Contract Broiler Farming in Bengaluru South Transect – A Comparative Analysis

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ABSTRACT: The present study attempted to analyse the marketing of broiler birds by both contract and non-contract broiler famers in Bengaluru South. For the study, 30 contract and 30 non-contract broiler famers were randomly selected. Shepherd's and Acharya's methods were used to calculate the marketing efficiency of broiler farming. The marketing channels for broilers in the study area involved four major intermediaries, *viz.*, integrators, wholesalers, processors, and retailers. In the case of contract farming, two channels were prevalent, *viz.*, Channel I: Producers / Growers (Contract Farmers) – Integrators – Wholesalers – Retailers / Butchers – Consumers; and Channel II: Producers / Growers (Contract Farmers) – Integrators – Processors – Consumers. The contract farmers were paid Rs. 6.20/- per kg of the bird's weight as rearing charges by the integrators. In the case of non-contract farming, the price paid by the ultimate consumer in Channel I (Producer – Wholesalers – Retailers – Consumers) and Channel II (Producers – Wholesalers – Processors – Consumers) was Rs. 182/- per kg and Rs. 356/- per kg, respectively. Accordingly, the marketing efficiency was 16.38 per cent and 17.94 per cent in Channel I and Channel II, respectively, thereby, indicating that Channel II was relatively more efficient than Channel I in marketing of broiler birds by non-contract farmers. The major production constraints faced by contract broiler farmers were disease outbreak, inadequate availability of labour, and high wages; whereas, sourcing of quality inputs, disease outbreak, and high feed cost were the major production constraints faced by non-contract broiler farmers. Among the marketing constraints, price fluctuation and inadequate access to market information were the major constraints faced by both contract and non-contract broiler farmers. The major challenge of the research work was getting reliable information from integrators pertaining to all aspects of contract farming.

Keywords: Marketing, Contract broiler farming, Non-contract broiler farming, Price spread, efficiency, constraints.

INTRODUCTION

Poultry, which includes chicken, duck, turkey, goose, etc., are a major source of animal protein for humans. Poultry meat and eggs are nutritious and relatively affordable sources of protein that are consumed around the world. Poultry farming provides employment opportunities for millions of people, particularly in developing countries. It is often a source of income for smallholder farmers who can sell poultry products in local markets. The poultry industry is a significant contributor to the economy of many countries. It generates income for farmers, processors, and distributors, and it creates jobs in related industries such as feed production and transportation. The poultry industry in India has undergone a major shift in structure and operation during the last two decades transforming from a mere backyard activity into a major industry with the presence of a large number of integrated players (Chaudhary *et al.*, 2020).

Poultry products, especially chicken and turkey, are generally low in fat and high in protein, making them a healthy addition to a balanced diet. Eggs are also a good source of vitamins and minerals. Poultry farming can be more environmentally sustainable than other forms of animal agriculture. Poultry require less land, water, and feed than many other livestock species, and their manure can be used as an organic fertilizer.

Poultry farming is an important sector of agriculture industry in India. It involves the raising of domesticated birds such as chicken, duck, goose, turkey, etc., for their meat, eggs, and feathers. India is the third-largest producer of eggs and the fifth-largest producer of poultry meat in the world. Poultry farming in India is dominated

by small and medium-scale farmers who rear birds for commercial purposes. The sector has grown rapidly in recent years due to the increasing demand for poultry products and the adoption of modern technologies and management practices. The major poultry producing states in India are Tamil Nadu, Andhra Pradesh, Telangana, West Bengal, Maharashtra, Karnataka, Assam, Haryana, and Kerala. The most commonly raised bird in India is the broiler chicken, followed by the layer chicken.

According to the 20th Livestock Census, there are 851.8 million poultry birds in India. About 30 per cent (250 million) of this is 'backyard poultry', mostly reared by marginal and small farmers. Tamil Nadu with 120 million followed by Andhra Pradesh (107 million), Telangana (80 million), West Bengal (77.3 million), Maharashtra (74.3 million), Karnataka (59.5 million), Assam (46.7 million), Haryana (46.3 million), and Kerala (29.8 million) are the major poultry producing States in the country.

Broiler farming plays an effective role in improving the economic status of the rural people by increasing their income besides providing nutritious food through meat (Ahamad *et al.*,2022). The Indian broiler industry experiences rapid growth driven by an increase in per capita consumption. The impressive growth in the poultry sector in general and the broiler industry, in particular, is the result of technological breakthroughs in breeding, feeding, and health; and sizeable investments from the private sector. The development of high yielding layer (310- 340 eggs) and broiler (2.4-2.6 kg at 6 weeks) varieties together with standardized package of practices on nutrition, housing, management, and disease control have contributed to spectacular growth rates in egg (4-6 % per annum) and broiler production (8-10 % per annum) in India during the last 40 years (Chatterjee and Rajkumar 2015).

The broiler industry is growing with the backward integration system providing opportunities for the rural masses with all the technical inputs and assured remuneration. However, these efforts have concentrated on productivity and production by neglecting several front-end activities such as wholesaling, processing, retailing and equitable inclusive development. India's per capita consumption of broiler meat is estimated at around 3.1 kgs per year, which is low compared to the world average of around 17 kgs per year (*www.icfa.org.in*).

MATERIALS AND METHODS

For the present study, Southern Bengaluru (transect) taking Vidhana Soudha as reference point which is located in the centre of Bengaluru city was purposively selected.

The villages in Bengaluru Urban and Ramanagara districts were randomly selected for the study. The villages surveyed were Thattuguppe, Thimmasandra, Mallehalli, Dodderi, Thittumarahalli, Kavanapura, Tharatte Estate, Muninagara, Gopalpur, and Gadipalya. The snowball sampling method was used for selection of 30 contract and 30 non- contract broiler farmers. The

primary data for the study were obtained from the sample farmers through personal interview method with the help of a pre-tested structured schedule. The collected data pertained to the agricultural year 2021-22.

A. Shepherd's and Acharya's Method
a) Shepherd's Formula. The efficiency of the broiler supply chain was calculated with the help of the following formula.
$$ESC = [(V/I)-1]$$
where,
ESC = Efficiency of broiler supply chain
V = Value of goods sold
I = Total marketing cost
Higher the ratio, higher would be the efficiency and vice versa.

b) Acharya's Approach. According to Acharya (2003), an ideal measure of marketing efficiency, particularly for comparing the efficiency of alternate markets channels should take into account all of the following.
    a) Total marketing costs (MC)
    b) Net marketing margin (MM)
    c) Prices received by the farmer (FP)
    d) Prices paid by the consumer (RP)
Further, the measure should reflect the following relationship between each of these variables and the marketing efficiency.
    i) Higher the (a), lower the efficiency
    ii) Higher the (b), lower the efficiency
    iii) Higher the (c), higher the efficiency
    iv) Higher the (d), lower the efficiency
As there is an exact relationship among four variables, *i.e.*, a+b+c = d, any three of these could be used to arrive at a measure for comparing the marketing efficiency.
The following measure is suggested by Acharya,
$$ME = FP \div (MC + MM)$$
Garrett's ranking technique. In this study, Garrett's ranking technique was used to rank the production and marketing constraints faced by farmers practising broiler farming in the study area. The order of the merit given by the respondents was converted into a per cent position using the formula.
$$\text{Per cent position} = 100 * (R_{ij} - 0.50) / N_j$$
where,
R_{ij} = Rank given for i^{th} item by j^{th} individual
N_j = Number of items ranked by j^{th} individual
The per cent position of each rank was converted to scores by referring to the table given by Garrett and Woodworth (1969). Then, for each factor, the scores of individual respondents were summed up and divided by the total number of respondents for whom scores were gathered. The mean score for all the factors/constraints were ranked, following the decision criteria that the higher the value, the more important is the order of preference by respondents. A study conducted by Rajendran and Mohanty (2003) also used Garrett's Ranking technique to analyse the constraints in egg production under cage vs. deep litter systems of rearing in India.

RESULTS AND DISCUSSION

A. Marketing of contract broiler birds

The marketing channels for broilers in the study area involved four major intermediaries, *viz.*, integrators, traders, processors, and retailers. The sample contract broiler farmers didn't sell the broilers directly to the consumers. The efficiency of marketing channels of broiler birds was calculated on per ton basis. Two marketing channels were prevalent in the study area. They were as follows:

Channel I: Producers / Growers (Contract Farmers) – Integrators – Wholesalers – Retailers / Butchers – Consumers

Channel II: Producers / Growers (Contract Farmers) – Integrators – Processors – Consumers

Marketing cost. The marketing of broiler birds in Channel I and Channel II are presented in Table 1. The marketing cost included labour charges (loading and unloading), transportation charges, mortality, weight loss, processing cost, and miscellaneous cost which added up to Rs. 5965/- and Rs. 27,426/- per ton in Channel I and Channel II, respectively. During transportation, mortality of birds does happen due to overcrowding and ambient temperature.

Table 1: Channel-wise marketing of broiler birds by contract farmers.

(in Rs. / ton)

Sr. No.	Particulars	Channel I	Channel II
1.	Net price received by the producer	6200	6200
2.	Integrator's selling price	75,560	75,560
3.	**Marketing cost incurred by trader**	**Rs.**	
a.	Labour	1997 (33.47)	
b.	Transportation	1020 (17.10)	
c.	Mortality	1450 (24.31)	
d.	Weight loss	998 (16.73)	
e.	Miscellaneous	500 (8.39)	
f.	Total marketing cost incurred by the wholesaler	5965 (100)	
4.	Purchase price of wholesaler	75,560	
5.	Wholesaler's selling price	1,40,350	
6.	Wholesaler's margin	64,790	
7.	**Marketing cost incurred by processors**		**Rs.**
a.	Labour		1522 (5.55)
b.	Transportation		2120 (7.73)
c.	Weight loss		498 (1.82)
d.	Mortality		1290 (4.70)
e.	Processing		21,496 78.38)
f.	Miscellaneous		500 (1.82)
g.	Total marketing cost incurred by the processors		27,426 (100)
8.	Purchase price of processors		75,560
9.	Processor's selling price		3,56,000
10.	Processor's margin		2,80,440
11.	Retailer's selling price	1,82,000	
12.	Retailer's margin	41,650	
13.	Producer's share in consumer rupee (%)	5.12	3.23
14.	Price spread	1,75,800	3,49,800

Note: The data on marketing cost and margin of integrator is not available

Channel I: Producers – Integrators – Wholesalers – Retailers – Consumers
Channel II: Producers – Integrators – Processors – Consumers
*Figures in parenthesis represents the percentage to the total marketing cost

The weight loss is due to the fact that feed is generally not given to the birds two hours before lifting; and obviously, feed is not given during transit between grow-out farms and processing plant. The marketing cost was higher in Channel II (Rs. 27,426/- per ton) when compared to that of Channel I (Rs. 5965/- per ton) as the cost of processing of birds alone accounted for Rs. 21,496/- per ton.

Marketing margin. In marketing of contract broiler birds (Channel I and Channel II), the producers received rearing charges of Rs. 6,200/- per ton (i.e., Rs. 6.20/- per kg) from the integrators. In Channel I, traders purchased broiler birds at Rs. 75,560/- per ton (i.e., Rs. 75.56/- per kg) from the integrators and sold at a price of Rs. 1, 40,350/- per ton (i.e., Rs. 140.35/- per kg) to retailers who in turn sold at Rs. 1, 82,000/- (i.e., Rs. 182/- per kg). Accordingly, the marketing margin of traders and retailers was Rs. 44,790/- (i.e., Rs. 44.79/- per kg) and Rs. 41,650/- (i.e., Rs. 41.65/-), respectively.

In the case of Channel II, the processors bought broiler birds from integrators at Rs. 75,560/- per ton (i.e., Rs. 75.56/- per kg) and sold to fast food restaurants such as KFC, McDonald's, Burger King, etc., at Rs. 3,56,000/- (i.e., Rs. 356/- per kg) which resulted in marketing margin of Rs. 2,80,440/- per ton (i.e., Rs. 280.44/- per kg).

Price spread. Price spread refers to the difference between the price paid by the consumer and the price received by the producer. The price spread varies depending on the number of intermediaries involved in the marketing channel. Hence, more the number of intermediaries, higher is the price spread. The price spread was estimated to be Rs. 1,75,800/- and Rs. 3,49,800/- in Channel I and Channel II, respectively.

Producer's share in consumer rupee. The producer's share in consumer rupee was 5.12 per cent, and 3.23 per cent in Channel I, and Channel II, respectively. The producer's share in consumer rupee was found to be higher in Channel I as compared to Channel II because of existence of processing cost in Channel II. The lower producer's share in consumer rupee was due to the fact that the contract farmers were only paid Rs. 6.20/- per kg by the integrators while they in turn sold the birds at a higher price.

B. Efficiency of marketing channels of non-contract broiler birds

The marketing channels for non-contract broiler birds in the study area were as follows.

Channel I: Producer – Wholesalers – Retailers – Consumers

Channel II: Producers – Wholesalers – Processors – Consumers

The marketing of broiler birds by sample non-contract farmers is presented in Table 2. Majority (63.33 %) of the non-contract farmers sold broiler birds through Channel I, while, 13.33 per cent of them sold through Channel II. About 23 per cent of the farmers used both Channel I and Channel II to sell broiler birds. In Channel I, wholesalers bought poultry birds from farmers and sold to retailers who in turn sold to consumers. In the case of Channel II, wholesalers purchased the birds from

farmers and sold to processors which ultimately reached the consumers.

The efficiency of marketing channels of broiler birds is presented in Table 3. The marketing cost included labour charges (loading and unloading), transportation charges, mortality, weight loss, processing cost, and miscellaneous cost which added up to Rs. 11,111.10/- and Rs. 19,835.58/- per ton in Channel I and Channel II, respectively. The price paid by the ultimate consumer in Channel I and Channel II was Rs. 1,82,000/- per ton (i.e., Rs. 182/- per kg) and Rs. 3,56,000/- per ton (i.e., Rs. 356/- per kg), respectively. Accordingly, the marketing efficiency was 16.38 per cent and 17.94 per cent in Channel I and Channel II, respectively, thereby, indicating that Channel II was relatively more efficient than Channel I in the marketing of broiler birds by non-contract farmers. A study conducted by Sanjiv (2014) found Channel I most efficient than other channels.

Table 2: Preference of marketing channels by non-contract broiler farmers. (n = 30)

Sr. No.	Channel	Channel	Number of farmers
1.	Channel I	Channel I	19 (63.33 %)
2.	Channel II	Channel II	4 (13.33 %)
3.	Both Channel I and Channel II	Both Channel I and Channel II	7 (23.33 %)

Table 3: Marketing efficiency of non-contract broiler farming under various marketing channels.
(n = 30

Sr. No.	Channel	Consumer price (Rs. / ton)	Marketing cost (Rs. / ton)	Marketing efficiency
1.	Channel I	1,82,000	11,111.10	16.38
2.	Channel II	3,56,000	19,835.58	17.94

C. Production constraints in contract broiler farming

The production constraints faced by the contract broiler farmers in the study area are presented in Table 4. Among the production constraints, outbreak of diseases was the major constraint faced by contract broiler farmers. The major disease affecting the broiler birds was avian influenza commonly known as bird flu. This is a viral disease which is highly contagious and may result in the death of the entire batch in few days. Furthermore, poor construction and improper management of shed involving inadequate disinfection by the sample broiler farmers also contributed to disease outbreaks impacting the productivity and output of broiler farms.

The second major production constraint was inadequate availability of labour. The availability of adequate labour for farm operations is an issue across the State and the situation was no different in the study area. Several farmers have employed labourers from other States, mostly from Bihar. High wages was the third major constraint. The inadequate availability of labour has

pressurised the farmers to pay higher wages. The fourth important constraint was high mortality rate. Even though the mortality rate of birds among sample broiler farmers was 3.5 per cent which was lower than the standard norm of five per cent, maintaining a low mortality rate is a big challenge among broiler farmers. Some of the sample broiler farmers experienced delay in getting credit due to deferred sanction by banks and therefore, it was ranked as fifth constraint. The sixth constraint was inadequate availability of veterinary services, this was because, in some cases, the veterinary services provided by the integrators were not on time. Inadequate availability of water was the seventh constraint. As mentioned earlier, in the study area, the main source of water for agriculture is rainfall and hence, most of the land was under dryland agriculture. The only source of irrigation for agriculture was groundwater from borewells.

D. Production constraints faced by non-contract broiler farmers

The production constraints faced by the sample non-contract broiler farmers is given in Table 5. Since there are no integrators in non-contract broiler farming, the sourcing of quality inputs was the major production constraint faced by the sample farmers. Similar findings

were found in a research conducted by Bhimraj *et al.* (2017) in Pune, Satara, and Ahmednagar districts of Maharashtra as well as Nath *et al.* (2012) in North Sikkim. The inputs included quality day-old chicks, quality feed, and timely veterinary care. The second important constraint was the outbreak of disease. In poultry, generally, any outbreak of disease leads to mortality of almost the entire flock resulting in significant losses. The third constraint faced was high feed cost. A study conducted by Kshash and Oda (2019) in Babylon province of Iran also found feed cost as a major constraint. As mentioned earlier, the birds require different types of feed based on their age. The sample farmers thus provided Nutri Chick, Pre-broiler Starter, Broiler Starter, Broiler Finisher, and Broiler Concentrates, which accounted for a sizable portion of the variable cost. Inadequate availability of labour was the fourth important constraint. The other constraints faced by sample farmers were high labour charges, inadequate availability of credit, high mortality rate, inadequate availability of veterinary services, and water shortage. Inadequate availability of credit was the major production constraint in a study conducted by Olaniyi *et al.* (2008) in Nigeria.

Table 4: Production constraints in contract broiler poultry farming.

Sl. No.	Constraint	Mean Garrett's Score	Rank
1.	Outbreak of diseases	68.83	I
2.	Inadequate availability of labour	66.60	II
3.	High wages	64.17	III
4.	High mortality rate	50.23	IV
5.	Inadequate availability of credit	37.33	V
1.	Inadequate availability of veterinary services	36.83	VI
7.	Scarcity of water	27.00	VII

Table 5: Production constraints faced by non-contract broiler farmers.

Sl. No.	Constraints	Mean Garrett's Score	Rank
1.	Sourcing of quality inputs	72.13	I
2.	Disease outbreak	68.87	II
3.	High feed cost	67.67	III
4.	Inadequate availability of labour	48.40	IV
5.	High wages	47.33	V
6.	Inadequate availability of credit	46.13	VI
7.	High mortality rate	45.40	VII
8.	Inadequate availability of veterinary services	36.07	VIII
9.	Water shortage	19.00	IX

E. Marketing constraints faced by contract broiler farmers

The marketing constraints faced by sample contract broiler farmers in the study area is presented in Table 6. Price fluctuation was the major constraint faced by contract broiler farmers. This is because the price of broiler birds keeps fluctuating depending on the demand, season, outbreak of bird flu, etc., which in turn influenced the contract price offered to contract farmers by the integrators. The second major constraint was the inadequate access to market information. A study

conducted by Ekunwe *et al.* (2006) indicated that many poultry entrepreneurs approach poultry production with mere enthusiasm rather than the actual knowledge of basic poultry production techniques. The contract farmers in the study area did not have enough knowledge regarding the final consumer price of birds and as a consequence decreased their bargaining power to negotiate with integrators for higher rearing charges. Delayed payments was the third major constraint faced by the contract broiler farmers.

Table 6: Marketing constraints in contract broiler poultry farming.

Sl. No.	Constraints	Mean Garrett's Score	Rank
1.	Price fluctuation	61.40	I
2.	Inadequate access to market information	50.00	II
3.	Delayed payments	38.60	III

F. Marketing constraints faced by non-contract broiler farmers

The marketing constraints faced by sample non-contract broiler farmers in the study area is presented in Table 7. Even in the case of non-contract broiler farmers, price fluctuation was the major constraint. This is because the price of broiler birds keeps fluctuating depending on the demand, season, outbreak of bird flu, etc., which in turn influenced the price received by the non-contract farmer (Bhattu *et al.*, 2015). The second major constraint was inadequate access to market information (Kshash and Oda, 2019 and Nath *et al.*, 2012). The non-contract broiler farmers in the study area also did not have enough knowledge regarding final price of the birds sold to customers which in turn decreased their bargaining power to get higher prices. Lack of co-operative marketing was the third major constraint faced by the non-contract farmers. High transportation charges was the fourth major marketing constraint faced by farmers. Delayed procurement of birds was the fifth major marketing constraint as in some cases, the birds were not procured on time and sometimes, the payments also got delayed. Inadequate transportation facility was also a marketing constraint faced by the non-contract broiler farmers. Tuffoura and Sedegah in 2013 in their study in Ghana reported that marketing constraints were more prominent among the broiler famers than production and financial constraints.

Table 7: Marketing constraints in non-contract broiler poultry farming.

Sr. No.	Constraints	Mean Garrett's Score	Rank
1.	High price fluctuation	69.60	I
2.	Inadequate access to market information	65.80	II
3.	Lack of co-operative marketing	57.00	III
4.	High transportation charges	42.40	IV
5.	Delayed payments	33.80	V
6.	Inadequate transport facilities	31.40	VI

CONCLUSION

In the study area, broiler marketing involved four intermediaries, *viz.*, integrators, traders, processors, and retailers. In the case of contract farming, two channels were prevalent, *viz.*, Channel I: Producers / Growers (Contract Farmers) – Integrators – Wholesalers – Retailers / Butchers – Consumers; and Channel II: Producers / Growers (Contract Farmers) – Integrators – Processors – Consumers. The contract farmers did not sell their broilers directly to consumers, but rather through these intermediaries. The contract farmers were paid Rs. 6.20/- per kg of the bird's weight as rearing charges by the integrators. The marketing cost was higher in Channel II (Rs. 27,426/- per ton) when compared to that of Channel I (Rs. 5965/- per ton) as the cost of processing of birds alone accounted for Rs. 21,496/- per ton. In the case of non-contract farming, the price paid by the ultimate consumer in Channel I (Producer – Wholesalers – Retailers – Consumers) and Channel II (Producers – Wholesalers – Processors – Consumers) was Rs. 182/- per kg and Rs. 356/- per kg, respectively. Accordingly, the marketing efficiency was 16.38 per cent and 17.94 per cent in Channel I and Channel II, respectively, thereby, indicating that Channel II was relatively more efficient than Channel I in marketing of broiler birds by non-contract farmers. The major production constraints faced by contract broiler farmers were disease outbreak, inadequate availability of labour and high wages; whereas, sourcing of quality inputs, disease outbreak and high feed cost were the major production constraints faced by non-contract broiler farmer. Among the marketing constraints, price fluctuations and inadequate access to market information were the major constraints faced by both contract and non-contract broiler farmers. The study suggests that increasing the rearing charges offered by the integrators can potentially lead to higher profits for contract farmers. Additionally, providing training to non-contract farmers regarding inputs, rearing, and marketing can help mitigate some of the risks associated with non-contract broiler farming.

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How to cite this article: A. Sree Lakshmi, M.R. Girish and Mamatha Girish (2023). Marketing of Broiler Birds under Contract and Non-Contract Broiler Farming in Bengaluru South Transect – A Comparative Analysis. *Biological Forum – An International Journal, 15*(5): 114-120.