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Value Chain Analysis of Broilers in Punjab - Journey from Farm to Fork

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ABSTRACT

The paper focuses on mapping the broiler value chains in Punjab and assessing the value creation and economic performance across different actors in these chains. The study collected primary data from 40 contract and non-contract broiler farmers in Ludhiana district. It identifies three major marketing value chains for contract farms and five for non-contract farms. In contract farming, the most efficient marketing chain, with the highest producer share in consumer rupees (51.97 per cent) and the greatest marketing efficiency (1.08), was found in the chain that involved contracting companies, wholesalers, retailers, and consumers. In non-contract farming, the most efficient value chain was the producer-retailer-consumer chain, with a marketing efficiency of 1.35 and a producer share of 57.57 per cent. The restaurants and roadside stalls added the most value in the broiler marketing chains, while farmers captured a smaller share. Producers could increase their profits by adding more value through nutritional improvements, such as feeding broilers omega-3-rich diets and enhancing the nutritional content of the meat. The study emphasizes the need for developing cooperative systems to reduce the influence of intermediaries who capture large shares of consumer spending. Additionally, promoting value addition at the producer level and improving marketing infrastructure would enhance the profitability and sustainability of broiler farming in Punjab.

Keywords: Broiler farming, chain actors, marketing, value addition, value chain

JEL codes : D21, Q13, Q12, O13

I

INTRODUCTION

The Indian poultry sector's success story is uniquely exceptional. It has made a quantum leap from a backyard venture to emerge as a dynamic sector. Over the last four decades, the poultry sector has grown the fastest among the livestock species, transforming itself into a supplier of the most economical protein sources for consumers through the development of value chains. Rising disposable incomes are driving the growth in the Indian poultry industry, changes in food habits, increasing urbanization trends, and shifting lifestyles (Tripathy *et al.,* 2022). The shift from the traditional diet, which relied heavily on pulses, to food products such as meat, eggs, and dairy to meet the protein requirements is significantly aiding the industry's growth. The poultry sector has thus played an essential role in the sustainable food supply chain because chicken meat emits fewer greenhouse gases (GHGs) than other forms of dietary protein (Caro *et al.,* 2017). By 2025, poultry meat is anticipated to have the greatest production and consumption levels worldwide, surpassing those of sheep, cattle, veal, and pork (Megan *et al.,* 2018). The Indian poultry industry significantly contributes to the country's food security, employment opportunities, and economic growth. As the world's third-largest poultry meat and eggs producer, India's annual

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production surpasses 4.78 million tons of chicken and 129.6 billion eggs (BAHS, 2022-23). In recent years, broiler production and farming have emerged as attractive farming activities due to the higher return on Investment (ROI) against the land area utilization. There has been a significant improvisation in feed conversion ratio (FCR) and other related production parameters in the last decade due to upgradation in genetic traits, superior feed formulations, and scientific management practices (Kumar and Torane 2019). The implementation of several efforts by the Indian government to promote poultry farming in the nation is also supporting market expansion (Kaur, 2020). The regional market is further being stimulated by the expansion of restaurants and fast-food outlets and the increasing use of meat and eggs in domestic and foreign non-vegetarian dishes.

Additionally, consumers with busy lifestyles are increasingly embracing pre-cooked, canned, processed, and frozen meat products, which is helping to drive up product demand in the nation. Customers today prefer nutritious, ready-to-eat meat and meat products (Bardhan *et al*., 2019). Their preference can be met only through value addition, i.e., by changing the physical state or form of the product to enhance its value.

Value chains are crucial in transforming agricultural products from raw materials to finished goods consumers want to buy. The value chain for broiler meat includes several actors, including the main producer, trader, processor, wholesaler, distributor, retailer, and consumer, from rearing to marketing. Despite the significant expansion in the poultry industry, the processing industry is still in its infancy because of less demand for ready-to-eat and ready-to-cook goods and less accessibility to processed chicken products. Currently, only 30 per cent of the chicken is processed into various chicken products (Kumar *et al.*, 2019). However, ongoing research and development results in the creation of effective and affordable poultry processing technology and well-recognized quality control standards.

The poultry industry has seen numerous setbacks due to rising feed prices, the introduction of new or reemerging diseases, fluctuating market prices for eggs and broilers, etc. These issues must be resolved for the poultry industry to become sustainable (Gopinath and Kalpana, 2019). Concerns over issues with animal welfare and environmental contamination by poultry units have grown. The absence of basic infrastructure, such as storage and transportation, especially cold chain, is a significant constraint preventing the expansion of the poultry business in India. As a result, there are significant price variations for poultry products, including broilers. Besides, there are various barriers to selling chicken products, including an unpredictable market, higher taxes on processed foods, competitive feed prices, expensive transportation costs, and a failure to adhere to food safety regulations. Value chains are market-oriented strategies focusing entirely on the market for all their activities. The study of marketing aspects is necessary and relevant to the present need. In Punjab state, the productivity and output of food grains, particularly cereals, have already reached a point of saturation with little potential for growth, leading to the consideration of broiler farming as a subsidiary occupation. In the backdrop of this, the present study

was conducted on the value chain analysis of broilers in the Ludhiana district of Punjab with specific objectives to (1) map the broiler value chains and identify value chain actors and (2) analyse the value creation and economic performance of identified value chain in Punjab.

II

MATERIALS AND METHODS

Ludhiana district was purposively chosen as the district is the leading producer of broilers, and being an industrial hub, the local market has the potential to consume and demand good-quality poultry products. Information regarding the number of broiler farms, their location, addresses, and the number of birds on each farm was obtained from the office of the Deputy Director of the Department of Animal Husbandry, Ludhiana. Twenty broiler farming units, each from the contract and non-contract farming systems, were randomly chosen from the selected district's blocks, namely Ludhiana and Khanna. Based on the number of birds, the broiler farms were divided into three strata using the cube root frequency method of stratification, viz. small, medium, and large. Broiler farms were selected based on profitability proportion to the number of broiler farms in each category.

Consequently, eight small, five medium, and seven large contract farmers, whereas seven small, six medium, and seven large non–contract farmers, making a total sample of 40, were selected for the study. The primary data were collected for the reference year 2021-22 by personal interview method using a specially designed and pre-tested schedule. The number of other value chain actors, viz traders, wholesalers, retailers, roadside stall owners, restaurants, etc., operating in the study were assessed for selecting them during the survey. Ten respondents per market functionary were chosen randomly, and data were obtained from each of them to work out marketing cost, margins, and efficiency (Acharya and Agarwal, 2014) in each of the identified channels as follows:

(i) Producer's Share in Consumer's Rupee

$$Ps = (PF / PR) * 100$$

Where,

Ps = Producer's share in consumer rupee
PF = Producer's or farmer's price
PR = Retail Price

(ii) Marketing Efficiency

$$MME = FP \div (MC+MM)$$

Where,

MME is a modified measure of marketing efficiency
FP is the price received by the farmer

MC and MM are marketing costs and marketing margins

Tabular analysis was used to interpret and compare the value chain actors of broilers. Statistical tools, such as simple averages, percentages, etc., were also used wherever required.

III

RESULTS AND DISCUSSION

Mapping of Broiler Value Chains and Identification of Value Chain Actors

Value chain refers to the series of actions taken by a firm operating in a specific field to supply valuable goods to customers. The structure and actors involved in bringing the good or service from its primary raw material to the consumer are described using a value chain map, as value chain analysis is an enterprise's profit and cost-effectiveness analysis. By utilizing key information from key informants and conducting group discussions, the different actors involved in the value chains were identified in contract and non-contract farms for the present study.

Value Chain Mapping Of Contract Broiler Farms

The value chains for contract broiler farms are presented in Figure 1. In these value chains, various actors were identified as per the marketing of broilers. Three marketing value chains were identified for contract broiler farms as follows:

1. Contracting Company - Co Wholesaler-Restaurant-Consumer
2. Contracting Company-Co Wholesaler-Retailer-Consumer
3. Contracting Company-Co Wholesaler-Retailer-Roadside Stall-Consumer

Companies were the principal providers of day-old chicks fed to the farms to rear the broilers. Contract producers were provided with chicks by companies to raise for them. Contract producers were given incentives to raise the broilers. They needed to invest very little as the companies bore major costs. The companies send their traders/ wholesalers to the producers to purchase broilers. Wholesalers/ Traders sold broilers to restaurants in one chain, and in another chain, broilers were sold to retailers. Wholesalers sold broilers to restaurants, and they further, by adding value, sold them to the final consumers. In another chain, wholesalers/ traders sold broilers to retailers. The retailers dressed the chicken and sold it to final consumers or roadside stalls. Roadside stalls added value to the broilers purchased from retailers and sold further to final consumers.

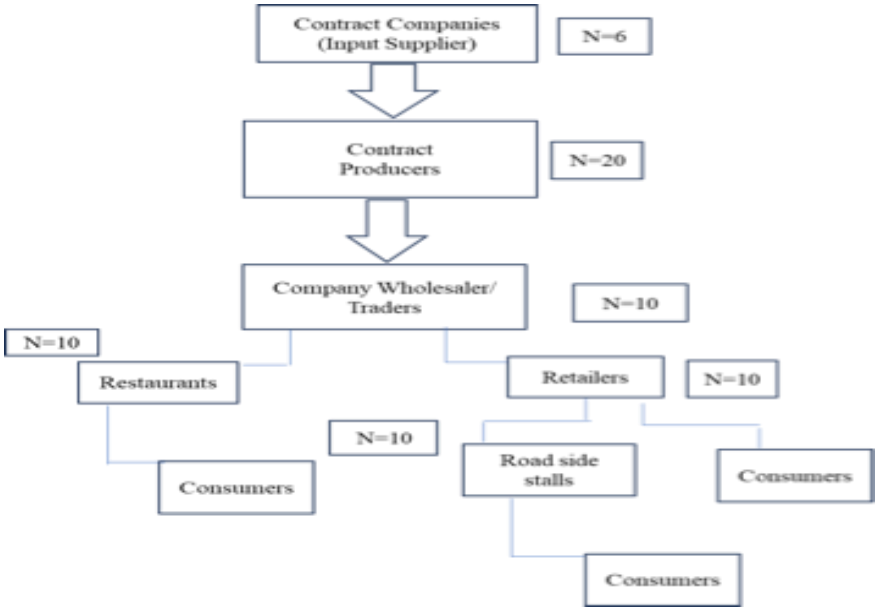

Figure 1. Broiler Value Chains Of Contract Farms

Value Chain Mapping of Non-Contract Farms

Value chain mapping for non-contract broiler farms is presented in Figure 2. In this, various value chain actors were identified as per the marketing of broilers. Five marketing value chains were identified for non-contract broiler marketing as follows:

1. Producer-Wholesaler-Retailer-Consumer
2. Producer-Wholesaler-Restaurant-Consumer
3. Producer-Wholesaler-Retailer-Roadside Stall-Consumer
4. Producer-Retailer-Consumer
   Producer-Retailer-Roadside Stall-Consumer

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5. Producer-Retailer-Roadside Stall-Consumer

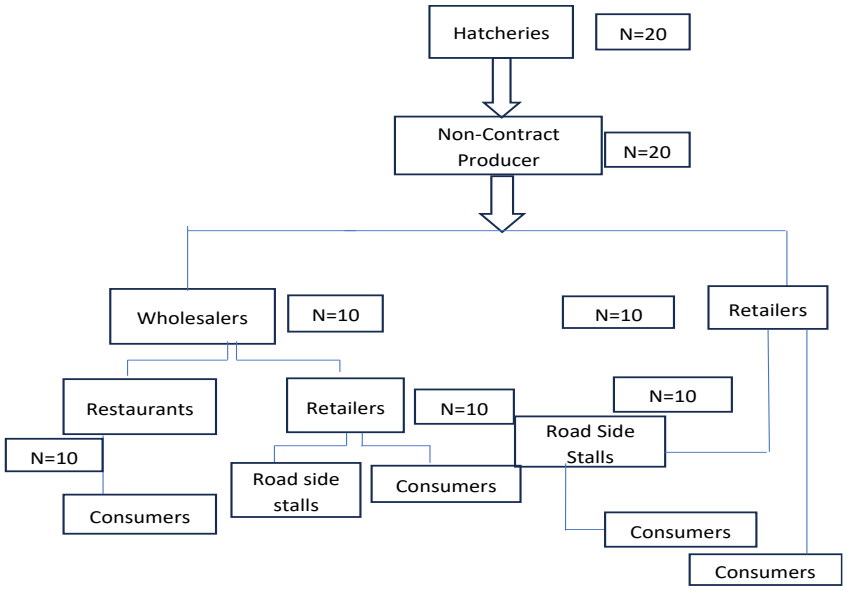

Figure 2. Broiler Value Chain of Non-Contract Farms

In non-contract farming, hatcheries provided inputs like day-old chicks to producers. Non-contract producers purchased day-old chicks, feed, medicines, etc., bore all the costs for raising broilers, and sold them to wholesalers or retailers in open markets. Wholesalers in the open market sold their broilers either to restaurants or retailers. In one chain, when wholesalers sold it to restaurants, which added value and sold it to final consumers. In another chain, when retailers purchased broilers from wholesalers, they added value to them by dressing and selling them to roadside stalls or final consumers roadside stalls after purchasing broilers from retailers added value and sold to final consumers.

In another chain, retailers purchase directly from producers and sell them to final consumers or roadside stalls in the open market. After purchasing broilers from retailers, roadside stalls add value and sell to final consumers.

Marketing of Broilers

The disposal pattern of broilers on non-contract farms is presented in Table 1. In the marketing of broilers from contract farms, all the broilers from farms were purchased by companies through their traders by paying incentives to the contract producers, but for non-contract farms, some of the producers sold their produce to wholesalers while some of them sold their produce to retailers. On non-contract farms, 57.14 per cent of small farmers, 66.67 per cent, and 85.71 per cent of medium and large farms, respectively, sold their produce to wholesalers, with an overall average of 70 per cent of farms selling their produce to wholesalers. Except for wholesalers, retailers were the only buyers of the produce from 42.86 per cent of small farms, 33.34 per cent of medium farms, and 14.29 per cent of large-size farms.

TABLE 1. DISPOSAL PATTERN OF BROILERS THROUGH VARIOUS INTERMEDIARIES IN NON – CONTRACT BROILER FARMS IN LUDHIANA DISTRICT, PUNJAB (2021-22)

Sr. No.	Particulars	Farm size category			
		Small	Medium	Large	Overall
(1)	(2)	(3)	(4)	(5)	(6)
1	Wholesaler	4 (57.14)	4 (66.67)	6 (85.71)	14 (70.00)
2	Retailer	3 (42.86)	2 (33.34)	1 (14.29)	6 (30.00)
3	Total	7 (100.00)	6 (100.00)	7 (100.00)	20 (100.00)

Note: Figures in parentheses indicate the percentages of their respective totals.

In terms of quantity, on average, non-contract producers sold 114307.70 kgs of their produce to wholesalers, while small farms sold 29138.40 kgs, followed by medium farms(101674.62 kgs) and large farms (179509.28 kgs). On average, non-contract producers sold 57741.95 kgs of produce to retailers. In comparison, 29678 kg was the quantity sold by small farmers, followed by 65661.70 kgs and 126094.32 kgs by medium and large farmers, respectively (Table 2).

TABLE 2. QUANTITY OF BROILERS DISPOSED OF THROUGH VARIOUS INTERMEDIARIES IN NON– CONTRACT BROILER FARMS IN LUDHIANA DISTRICT, PUNJAB (2021-22)

(kgs)

Sr. No.	Particulars	Farm size category			
		Small	Medium	Large	Overall
(1)	(2)	(3)	(4)	(5)	(6)
1	Wholesaler	29138.40 (49.54)	101674.62 (60.76)	179509.28 (58.74)	114307.70 (66.44)
2	Retailer	29678.00 (50.45)	65661.70 (39.23)	126094.32 (41.26)	57741.95 (33.56)
3	Total	58816.40 (100.00)	167336.32 (100.00)	305603.60 (100.00)	172049.65 (100.00)

Note: Figures in parentheses indicate the percentages of their respective totals

Marketing Value Chains of Broilers

Marketing of broilers through different value chains refers to the path through which a commodity moves from the producer to the ultimate consumer. Major marketing value chains in contract broiler farming were:

1. Contracting Company - Co Wholesaler-Restaurant-Consumer
2. Contracting Company-Co Wholesaler-Retailer-Consumer
3. Contracting Company-Co Wholesaler-Retailer-Roadside Stall-Consumer

Major marketing value chains in non-contract broiler farming were as follows:

1. Producer-Wholesaler-Retailer-Consumer
2. Producer-Wholesaler-Restaurant-Consumer
3. Producer-Wholesaler-Retailer-Roadside Stall-Consumer
4. Producer-Retailer-Consumer
5. Producer-Retailer-Roadside Stall-Consumer

Marketing Margins and Marketing Costs of Intermediaries in Contract Marketing Value Chains.

The marketing margins and costs of various intermediaries in contract marketing value chains have been presented in Table 3. The perusal of the Table reveals that the producer in Chain-I (Contracting Company-Co Wholesaler-Restaurant-Consumer) received Rs 98.75 of the consumer's rupees (Rs 520) in this channel. Total marketing costs and marketing margins for chain-I estimated to be Rs 82.13 and Rs 339.12, respectively, having a percentage share of 15.79 per cent and 65.22 per cent in consumer's rupee. Marketing margins for the restaurant came out to be highest at Rs 274.22 with a percentage share of 52.73 per cent, and the marketing margin for the wholesaler was Rs 64.90 with a per cent share of 12.48 per cent of the consumer's rupee. The chain's overall price spread was Rs 421.25, and the producer's share of the consumer's rupee was 18.99 per cent. It has been revealed that the price the producer received for the marketing of broilers in Chain II was Rs 98.75. In this chain, the total marketing margins and costs came to be Rs. 13.97 and Rs. 77.28, with respective percentage shares of 7.35 per cent and 40.67 per cent. Retailers had a marketing margin of Rs 43.63 (22.96 per cent), while wholesalers had a marketing margin of Rs 33.65 with a percentage share of Rs 17.71 per cent in the consumer's rupee. The price spread in this chain was estimated to be Rs 91.25, while the producer's share in the consumer's rupee was 51.97 per cent. The price received by the producer by marketing broilers in Chain-III (Contracting Company-Co Wholesaler-Retailer-Roadside Stall-Consumer) was Rs 98.75 with percentage shares of 21.42 per cent and 47.81 per cent, the total marketing margins and marketing costs for this channel came out to be Rs. 153.49 and Rs. 68.76, respectively. The marketing margins of roadside stalls in this chain were Rs 76.21 (23.74 per cent), while the marketing margins of retailers were Rs 43.63 (13.59 per cent) and the marketing margin of wholesalers were Rs 33.65 (10.48 per cent) respectively. The price spread in this chain was estimated to be Rs 222.25, and the producer's share of the consumer rupee was 30.76 per cent.

TABLE 3: COSTS AND MARGINS THROUGH VARIOUS MARKETING CHAINS OF CONTRACT BROILER PRODUCTION IN LUDHIANA DISTRICT, PUNJAB (2022-23)

(Rs/kg)

Sr. No	Particulars	Chain I (Contracting company- Co Wholesaler-Restaurant-Consumer)	Chain II (Contracting company- Co Wholesaler-Retailer-Consumers)	Chain III (Contracting company- Co-Wholesaler-Retailer-Road side Stalls-Consumer)
1.	Net price received by contracti company/ wholesaler's purchasepri	98.75 (18.99)	98.75 (51.97)	98.75 (30.76)
2.	Costs incurred by wholesaler			
i).	Transportation charges	0.36 (0.07)	0.36 (0.19)	0.36 (0.11)
ii).	Loading unloading charges	0.41 (0.08)	0.41 (0.22)	0.41 (0.13)
iii).	Labor charges	0.25 (0.05)	0.25 (0.13)	0.25 (0.08)
iv).	Driver charges	0.16 (0.03)	0.16 (0.08)	0.16 (0.05)
v).	Shop rent	0.08 (0.02)	0.08 (0.04)	0.08 (0.02)
vi).	Mortality	0.005 (0.001)	0.005 (0.002)	0.005 (0.001)
vii).	Miscellaneous charges	0.08 (0.001)	0.08 (0.04)	0.08 (0.02)
	Total marketing costs of wholesaler	1.35 (0.26)	1.35 (0.71)	1.35 (1.42)
	Wholesaler's margin	64.90 (12.48)	33.65 (17.71)	33.65 (10.48)
	Wholesaler's sale price	165.00 (31.73)	133.75 (70.39)	133.75 (41.67)
3.	Costs incurred by retailer		1.02	0.20
i).	Transportation cost		0.33 (0.17)	0.33 (0.10)
ii).	Taxes paid		4.44 (2.34)	4.44 (1.38)
iii).	Storage price		2.67 (1.41)	2.67 (0.83)
iv).	Packing and labeling		0.83 (0.44)	0.83 (0.26)
v).	Labour charges		2.59 (1.36)	2.59 (0.81)
vi).	Building Rent		0.96 (0.51)	0.96 (0.30)
vii).	Electricity charges		0.24 (0.13)	0.24 (0.07)
viii).	Miscellaneous charges		0.56 (0.29)	0.56 (0.17)
	Total marketing costs of retailer		12.62 (6.64)	12.62 (3.93)
	Retailer's sale price		190.00 (100.00)	43.63 (13.59)
	Retailer's margin		43.63 (22.96)	190.00 (59.19)
4.	Costs incurred by roadside stalls			
i).	Coal			0.73 (0.22)
ii).	Ingredients			17.67 (5.50)
iii).	Rent			4.83 (1.50)

TABLE 3 CONCLD.

iv).	Oil			8.00
				(2.49)
v).	Tax			3.33
				(1.04)
vi).	Cylinder			3.42
				(1.07)
vii).	Petrol			1.50
				(0.47)
viii).	Labor charges			7.31
				(2.28)
ix).	Miscellaneous charges			8.00
				(2.49)
	Total marketing costs of vendors			54.79
				(17.07)
	Roadside Stalls sale price			76.21
				(23.74)
	Roadside Stalls margin			321.00
				(100.00)
5.	Costs incurred by Restaurants			
i).	Advertisement	0.78		
		(0.15)		
ii).	Promotions	0.40		
		(0.08)		
iii).	Packing and labelling	1.83		
		(0.35)		
iv).	Taxes	1.39		
		(0.27)		
v).	Storage	1.57		
		(0.30)		
vi).	Cost of preparation	49.57		
		(9.53)		
vii).	Labor charges	17.45		
		(3.56)		
viii).	Shop rent	3.90		
		(0.75)		
ix).	Repair	0.84		
		(0.16)		
x).	Electricity charges	2.03		
		(0.39)		
xi).	Others	1.02		
		(0.20)		
	Total marketing costs of Restaurants	80.78		
		(15.53)		
	Restaurants sale price	520.00		
		(100.00)		
	Restaurants margin	274.22		
		(52.73)		
6.	Total marketing cost	82.13	13.97	68.76
		(15.79)	(7.35)	(21.42)
7.	Total marketing margin	339.12	77.28	153.49
		(65.22)	(40.67)	(47.81)
8.	Price spread	421.25	91.25	222.25
		(81.00)	(48.03)	(69.23)
9.	Producer's share in consumer's rupee (%)	18.99	51.97	30.76

Note: Figures in parentheses indicate the percentages of their respective totals.

Marketing Margins and Marketing Costs of Intermediaries in Non-Contract Marketing Value Chains.

The marketing margins and costs of various intermediaries in non-contract marketing value chains have been presented in Table 4.In Chain-I of non-contract farms for the marketing of broilers in the Ludhiana market. The table reveals that the producer received Rs 95.00 of the consumer's rupee in marketing Chain-I (Producer-Wholesaler-Retailer-Consumer). The total marketing costs and margins in broilers' marketing were Rs. 7.17 and Rs. 82.83, with respective percentage shares of 3.88 and 44.77 per cent. The retailer's marketing margin was found to be higher than the wholesaler's marketing margin.

Similar findings were observed by Chahal *et al.* (2004). Marketing margins of wholesalers and retailers were Rs 33.77 (26.51 per cent) and Rs 49.06 (18.25 per cent) respectively. Hence, the total price spread was estimated at Rs 90.00. The producer's share in the consumer's rupee is estimated at 51.35 per cent.

In Chain-II of non-contract farms for the marketing of broilers in the Ludhiana market. In marketing Chain-II of broilers (Producer-Wholesaler-Restaurant-Consumer) was a major chain in Ludhiana district. Producers in this chain received Rs 95.00 of the consumer's rupee. In this channel, the total marketing costs and margins were Rs 78.95 and Rs 297.73, respectively, with percentage shares of 16.74 and 63.12 per cent. In this chain, the restaurant's margin was highest at Rs 239.78 (50.84 per cent), and the margin of wholesalers was Rs 57.94 (12.28 per cent). Hence, the total price spread in this channel was Rs 376.67, and the producer's share in the consumer's rupee was 20.14.

The producer received Rs 95.00 of the consumer's rupee in the marketing Chain-III (Producer-Wholesaler-Retailer-Roadside Stall-Consumer). This chain's estimated total marketing costs and margins were Rs 61.96 and Rs 164.04, respectively, with percentage shares of 19.30 per cent and 51.10 per cent in consumer's rupee. In this chain, it was found that the roadside stall had the highest marketing margin with Rs 81.21, followed by Rs 49.06 for retailers and Rs 33.77 for wholesalers, and their respective percentage shares of consumer's rupee were 25.30 per cent, 15.28 per cent, and 10.52 per cent respectively. The total price spread in this chain was Rs 226.00, with a 29.60 per cent producer's share in the consumer's rupee.

In marketing Chain IV (Producer - Retailer - Consumer the estimated total marketing costs and margins for this Chain were Rs. 13.17 and Rs. 56.83, with percentage shares of 7.98 per cent and 34.4 per cent, respectively. The retailer's margin for this chain was Rs 56.83, with a percentage share of 34.44 per cent in consumer's rupee. The estimated total price spread was Rs. 70.00, while the producer's share of the consumer's rupee was Rs. 57.57 per cent.

TABLE 4. COSTS AND MARGINS THROUGH VARIOUS MARKETING CHAINS OF NON-CONTRACT BROILER PRODUCTION IN LUDHIANA DISTRICT, PUNJAB (2022-23)

(Rs/kg)

Sr. No.	Particulars	Chain I (Producer-Wholesaler-Retailer-Consumer)	Chain II (Producer-Wholesaler-Restaurant-Consumer)	Chain III (Producer-Wholesaler-Roadside Stall-Consumer)	Chain IV (Producer-Retailer-Consumer)	Chain V (Producer-retailer-roadside stall-consumer)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1.	Net price received by contracting company/ wholesaler's purchase price	95.00 (57.58)	95.00 (20.14)	95.00 (29.60)	95.00 (57.58)	95.00 (31.67)
2.	Costs incurred by wholesaler					
i).	Transportation charges	0.53 (0.28)	0.53 (0.11)	0.53 (0.17)		
ii).	Loading unloading charges	0.64 (0.34)	0.64 (0.14)	0.64 (0.20)		
iii).	Labor charges	0.44 (0.24)	0.44 (0.09)	0.44 (0.14)		
iv).	Driver charges	0.21 (0.11)	0.21 (0.04)	0.21 (0.07)		
v).	Shop rent	0.10 (0.05)	0.10 (0.02)	0.10 (0.03)		
vi).	Mortality	0.005 (0.002)	0.005 (0.001)	0.005 (0.001)		
vii).	Miscellaneous charges	0.13 (0.07)	0.13 (0.03)	0.13 (0.04)		
	Total marketing costs of wholesaler	2.06 (1.11)	2.06 (0.44)	2.06 (0.64)		
	Wholesaler's margin	33.77 (18.25)	57.94 (12.28)	33.77 (10.52)		
	Wholesaler's sale price	130.83 (70.72)	155.00 (32.86)	130.83 (40.76)		
3.	Costs incurred by retailer					
i).	Transportation cost	0.42 (0.23)		0.42 (0.13)	3.45 (2.09)	3.45 (1.15)
ii).	Taxes paid	1.71 (0.92)		1.71 (0.53)	3.10 (1.88)	3.10 (1.03)
iii).	Storage price	0.42 (0.23)		0.42 (0.13)	0.69 (0.42)	0.69 (0.23)
iv).	Packing and labeling	0.44 (0.24)		0.44 (0.14)	0.38 (0.23)	0.38 (0.13)
v).	Labour charges	1.30 (0.70)		1.30 (0.40)	3.08 (1.87)	3.08 (1.03)
vi).	Shop Rent	0.38 (0.21)		0.38 (0.12)	0.63 (0.38)	0.63 (0.21)
vii).	Loading Unloading charges	-		-	0.83 (0.50)	0.83 (0.28)
viii).	Electricity charges	0.12 (0.06)		0.12 (0.04)	0.39 (0.24)	0.39 (0.13)
ix).	Miscellaneous charges	0.32 (0.17)		0.32 (0.09)	0.62 (0.38)	0.62 (0.21)
	Total marketing costs of retailer	5.11 (2.76)		5.11 (1.59)	13.17 (7.98)	13.17 (4.39)
	Retailer's margin	49.06 (26.51)		49.06 (15.28)	56.83 (34.44)	56.83 (18.94)
	Retailer's sale price	185.00 (100.00)		185.00 (57.63)	165.00 (100.00)	165.00 (55.00)
4.	Costs incurred by Roadside stalls				165.00	100.00
i).	Coal			0.73 (0.23)		0.73 (0.24)

ii).	Ingredients			17.67		17.67
				(5.50)		(5.89)
iii).	Rent			4.83		4.83
				(1.50)		(1.61)
iv).	Oil			8.00		8.00
				(2.49)		(2.67)
v).	Tax			3.33		3.33
				(1.04)		(1.11)
vi).	Cylinder			3.42		3.42
				(1.07)		(1.14)
vii).	Petrol			1.50		1.50
				(0.47)		(0.50)
viii).	Labor charges			7.31		7.31
				(2.28)		(2.44)
ix).	Miscellaneous			8.00		8.00
	charges			(2.49)		(2.67)
	Total marketing costs			54.79		54.79
	of Roadside stalls			(17.07)		(18.26)
	Roadside Stalls			81.21		80.21
	margin			(25.30)		(26.74)
	Roadside Stalls sale			321.00		300.00
	price			(100.00)		(100.00)
5.	Costs incurred by Restaurants				61.96	19.30
i).	Advertisement		0.80			
			(0.17)			
ii).	Promotions		0.14			
			(0.03)			
iii).	Packing and labelling		4.12			
			(0.87)			
iv).	Taxes		1.76			
			(0.37)			
v).	Storage		1.64			
			(0.35)			
vi).	Cost of preparation		52.10			
			(11.05)			
vii).	Labor charges		9.03			
			(1.91)			
viii).	Shop rent		3.10			
			(0.66)			
ix).	Repair		0.77			
			(0.16)			
x).	Electricity charges		2.11			
			(0.44)			
xi).	Others		1.32			
			(0.28)			
	Total marketing costs		76.89			
	of Restaurants		(16.30)			
	Restaurants margin		239.78			
			(50.84)			
	Restaurants sale price		471.67			
			(100.00)			
6.	Total marketing cost	7.17	78.95	61.96	13.17	67.96
		(3.88)	(16.74)	(19.30)	(7.98)	(22.65)
7.	Total marketing	82.83	297.73	164.04	56.83	137.04
	margin	(44.77)	(63.12)	(51.30)	(34.44)	(45.68)
8.	Price spread	90.00	376.67	226.00	70.00	205.00
		(48.65)	(79.86)	(70.40)	(42.42)	(68.34)
9.	Producer's share in consumer's rupee (%)	51.35	20.14	29.60	57.57	31.67

Note: Figures in parentheses indicate the percentages of their respective totals.

The table shows that the producer's share in the consumer's rupee in marketing Chain V (Producer- Retailer-Roadside Stalls-Consumer) was 31.67 per cent, and the total price spread in this channel was Rs 205.00. The estimated total marketing costs and margins in the chain were Rs 67.96 and Rs 137.04, with respective percentage shares of 22.65 per cent and 45.68 per cent. With percentage shares of 26.74 per cent and 18.94 per cent, respectively, the margin of roadside stalls in this channel was highest at Rs. 80.21, followed by the retailer's margin at Rs. 56.83.

Marketing Efficiency in Contract and Non-Contract Broiler Marketing Chains

Table 5 shows that Chain-II had the highest marketing efficiency of 1.08 in the contract marketing of broilers, with 51.97 per cent of the producer's share in consumer's rupees.

TABLE 5. COMPARISON OF COSTS, MARGINS AND MARKETING EFFICIENCY IN CONTRACT AND NON-CONTRACT BROILER MARKETING CHAINS IN LUDHIANA DISTRICT, PUNJAB (2021-22) (Rs/kg)

Sr. No.	Particulars	Marketing Value Chains							
		contract farms			non-contract farms				
		I (Co-W-RE-C)	II (Co-W-R-C)	III (Co-W-R-V-C)	I (P-W-R-C)	II (P-W-RE-C)	III (P-W-R-V-C)	IV (P-R-C)	V (P-R-V-C)
1	Producer's net price	98.75	98.75	98.75	95.00	95.00	95.00	95.00	95.00
2	Total marketing cost	82.13	13.97	68.76	7.17	78.95	61.96	13.17	67.96
3	Total marketing margin	339.12	77.28	153.49	82.83	297.73	164.04	56.83	137.04
4	Price spread	421.25	91.25	222.25	90.00	376.67	226.00	70.00	205.00
5	Consumer's price	520.00	190.00	321.00	185.00	471.67	321.00	165.00	300.00
6	Producer's share in consumer's rupee (Per cent)	18.99	51.97	30.76	51.35	20.14	29.60	57.57	31.67
7	Marketing efficiency index	0.23	1.08	0.44	1.06	0.25	0.42	1.35	0.46

Its total marketing costs and margins were Rs 13.97 and Rs 77.28, respectively. In Chain-III, the efficiency was 0.44, with the producer's share in the consumer's rupee of 30.76 per cent. Total marketing costs and total marketing margins were Rs 68.76 and Rs 153.49, respectively, whereas in Chain-I Chain-I's marketing efficiency was 0.23, with a total marketing cost of Rs 82.13 and a marketing margin of Rs 339.12, with an 18.99 per cent producer share in consumer rupees. Hence, marketing Chain II was considered better for marketing broilers in the study area. In non-contract broiler farms, with a producer share of 57.57 per cent in the consumers' rupee, a total marketing cost of Rs 13.13, and a marketing margin of Rs 56.83, with a price spread of Rs 70.00, Chain-IV shows the highest marketing efficiency of 1.35. In Chain-I, marketing efficiency was 1.06, followed by Chain-V, III, and II, with marketing efficiency of 0.46, 0.42, and 0.25, respectively.

Distribution of Value Addition Across Chain Actors

Contract Farms

Value addition is gaining a competitive edge by fusing features and benefits, packaging them, or using any other technique that boosts consumer acceptance. Value addition is crucial in transforming products from raw materials to finished goods that consumers want to buy. Value chain analysis divides the various processes that contribute value while creating and selling a good or service. Table 6 shows the distribution of value addition in contract marketing chains for broilers.

TABLE 6. DISTRIBUTION OF VALUE ADDITION IN DIFFERENT CONTRACT BROILER MARKETING VALUE CHAINS IN LUDHIANA DISTRICT OF PUNJAB (2021-22)

S. No	Particulars	Chain I (Contract Company- Co Wholesaler-Restaurant-Consumer)		Chain II (Contracting company- Co Wholesaler-Retailer-Consumer)		Chain III (Contracting company-Co wholesaler–Retailer-Roadside Stalls-Consumer)	
		Cost/sale price	% value added	Cost/ sale price	% value added	Cost/sale price	% value added
1.	Costs of inputs supplied	79.81	-	79.81	-	79.81	-
2.	Net price received by contracting companies per kg of live weight	98.75	23.73	98.75	23.73	98.75	23.73
3.	Net price received by wholesalers per kg of live weight	165.00	67.09	133.75	35.44	133.75	35.44
4.	Net price received by retailers per kg of live weight	-	-	190.00	42.06	190.00	42.06
5.	Net price received by roadside stalls per kg of live weight	-	-	-	-	321.00	68.95
6.	Net price received by restaurants Per kg of live weight	520.00	215.15	-	-	-	-

Non-Contract Farms

The table revealed that in Chain-I, the highest value was added by restaurants at 215.15 per cent. In contrast, producers added a value of 23.73 per cent in Chain-I, followed by 42.06 per cent of value addition by retailers in Chain-II, and 68.95 per cent of value was added by Roadside stalls in Chain-III, which were highest in their respective chains. These findings aligned with the findings of Kumar et al. (2019). In Chains II and III, producers added 23.73 per cent of the value. Compared to all three chains, the highest value was added in Chain-I, followed by Chain-III and II.

Table 7 shows the distribution of value addition in non-contract marketing chains for broilers.

TABLE 7. DISTRIBUTION OF VALUE ADDITION IN DIFFERENT NON-CONTRACT BROILER MARKETING VALUE CHAINS IN LUDHIANA DISTRICT OF PUNJAB (2021-22)

Sr. No.	Particulars	Chain I (Producer-Wholesaler-Retailer-Consumer)		Chain II (Producer-Wholesaler-Restaurant-Consumer)		Chain III (Producer-Wholesaler-retailer-roadside Stalls-Consumer)		Chain IV (Producer-Retailer-Consumer)		Chain V (Producer-Retailer-Roadside Stalls- Consumer)	
		Cost/sale price	% value added	Cost/sale price	% value added	Cost/sale price	% value added	Cost/sale price	% value added	Cost/sale price	% value added
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1.	Costs of inputs supplied	79.81	-	79.81	-	79.81	-	79.81	-	79.81	-
2.	Net price received by producers per kg of live weight	95.00	19.03	95.00	19.03	95.00	19.03	95.00	19.03	95.00	19.03
3.	Net price received by wholesalers per Kg of live weight	130.83	37.72	155.00	63.16	130.83	37.72	-	-	-	-
4.	Net price received by retailers per kg of live weight	185.00	41.40	-	-	185.00	41.40	165.00	73.68	165.00	73.68
5.	Net price received by roadside stalls per kg of live weight	-		-	-	321.00	73.51	-	-	300.00	81.81
6.	Net price received by restaurants per kg of live weight	-		471.67	204.30	-		-	-	-	-

The table revealed that in Chain-I, the highest value was added by retailers with (41.40 per cent) whereas producers added a value of 19.03 per cent in Chain-I. In Chain II, restaurants added 204.30 per cent of the value. In comparison, 73.51 per cent of value was added by roadside stalls in Chain-III, 73.68 per cent of value was added by retailers in chain-IV, and 81.81 per cent was added by roadside stalls in Chain-V, which was the highest value added in their respective chains. Compared to all five chains, the highest value was added in Chain II, followed by Chain-V, IV, III, and I. In all the chains, producers added a value of 19.03 per cent.

From the above, it is obvious that private traders control the marketing of broilers, and most poultry meat trading puts farmers in a disadvantageous position by

giving them lesser profit margins than the traders. Value addition at the retailer/restaurant level was found to be of the highest value. The broiler producer can profit by adding more value to broilers by making nutritional manipulations in feed.

IV

CONCLUSIONS AND POLICY IMPLICATIONS

The results of the marketing aspect of broilers showed that contract farmers sold their produce to the traders sent by a company to procure broilers from the farm. In contrast, the non-contract farmers sold 70 per cent of their produce to wholesalers and 30 per cent of their total produce to retailers. In contract farming, Chain-II (Contracting company- Co Wholesaler-Retailer-Consumer) was the most efficient value chain due to its higher market efficiency of 1.08 and producer share of the consumer rupee of 51.97 per cent. followed by Chain-III and Chain-I. Whereas for non-contract farming out of the five identified marketing value chains, Chain-IV (Producer-Retailer-Consumer) was found to be more efficient with 57.57 per cent share of producer in consumer's rupee and the marketing efficiency was 1.35, followed by Chain-I, V, III, and II respectively. In Chain-I of contract farms, the highest value of 215.15 per cent was added by restaurants. In comparison, in Chain-II, 42.96 per cent of the value, which was maximum in this chain, was added by retailers, and in Chain-III, 68.95 per cent of the value was added by roadside stall owners, which was maximum in this chain, whereas in all the three chains producers added 23.73 per cent of value to the broilers. In non-contract farms in Chain-I, the maximum value of 42.31 was added by retailers, while in Chain-II, III, IV, and V, the maximum value was added by restaurants (203.87 per cent), roadside stalls (73.51 per cent), retailers (73.68 per cent) and roadside stalls(81.81 per cent) respectively. To boost profits, adding value to poultry is essential. Value addition at the producer level may be achieved through dietary modifications, such as feeding chicks with rich omega-3 fatty acids, which will help increase omega-3 fatty acids in broiler meat. The majority of the trading in poultry meat leaves farmers in a disadvantageous position by offering them smaller profit margins than the traders. The cooperative system should be evolved in the marketing of broiler meat, which would reduce the involvement of the middlemen who get the lion's share of the consumer rupees.

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