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## **Broilers' Supply Value Chain in the National Capital Region Delhi: A Case Study of Ghazipur Poultry Market**

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### **Abstract**

The marketing of broilers/chicken meat in the National Capital Region (NCR) Delhi has been compared in two distinct kinds of markets, viz. organized (shopping malls, organized multi-product retailers) and unorganized or primarily wet markets (exclusive chicken dressers, poultry meat retailers, etc.). Data have been collected from various functionaries involved in marketing of broilers/poultry meat in the NCR Delhi during the year 2008-09 through primary survey. The most prominent channel in the unorganized broiler market has been found as: *Producer-Wholesaler-Dresser-cum-Retailers-Consumer*, whereas the same in the organized market as *Producer-Commission agent-Supplier-Distributor-Shopping Malls/Hotels/Retailer-Consumer*. The marketing cost, marketing margins, price spread and producers' share in consumers' rupee, in the most efficient unorganized marketing channel have been found as Rs 10480, Rs 30220, Rs 40700 per tonne (live wt. basis) and 62 per cent, respectively, whereas the corresponding figures in the most efficient organized marketing channel were Rs 12750, Rs 76350, Rs 88500 per tonne and 43 per cent.

The wholesale regulated poultry market at Ghazipur was the key supply centre for chicken in the NCR Delhi. The average daily arrival in the poultry market has been found over one lakh broilers accounting for about 50 per cent sales in Delhi. Over 70 per cent of the broilers at Ghazipur Poultry Market are manually dressed. The manual poultry processing has provided direct employment to nearly 5000 workers. The manual dressing of broilers has resulted in value addition of about 50 per cent on live weight basis and production of over 20 chicken meat products/ by-products. The study has also assessed the pros and cons of manual dressing of broilers vis-à-vis mechanical processing and has estimated the cost of processing in the two systems. It has been observed that manual dressing of broilers is not only cheaper but also provides employment and livelihood to a large number of illiterate and/ or semi-skilled workers. Hence, the study has suggested to improve and organize the manual dressing system so that the qualitative aspects and concerns about health and hygiene could also be addressed. Erratic power supply, long power cuts, lack of refrigerated transportation facility, poor monitoring of food safety and quality norms in manual processing, rampant corruption in transportation of live chickens, etc. have been identified as the major constraints in marketing of broilers/chicken meat in the NCR Delhi.

### **Introduction**

Poultry has been one of the fastest growing segments of agricultural sector in India with compound annual growth rates of 5.57 per cent and 11.44 per cent in egg and broiler production during the period 1999 to 2008, respectively. Globally, India ranked 3<sup>rd</sup> after China and USA, with a production of 53.3 billion

eggs and 5<sup>th</sup> after USA, China, Brazil, and Mexico, with a production of 3.6 million tonnes (2007-08) of chicken meat (GoI, 2008), contributing nearly 2 per cent to the world's chicken production. With an annual turnover of over Rs 400 billion, poultry industry provides direct-indirect employment to over five million people in the country and has great potential to provide gainful employment with increase in poultry consumption. The poultry sector accounts for 0.67 per cent of the India's gross domestic product (GDP) and about 10 per cent

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of the livestock GDP. The domestic consumption of poultry meat in India during 1999-2004 grew at an average annual growth rate of 5 per cent and 10 per cent in quantity terms in rural and urban areas, respectively, whereas in value terms, the corresponding increase was 11.09 per cent and 7.43 per cent [NSSO (various issues)].

Delhi, with a population of about 18 million, is one of the major consumers of poultry products in the country having average per capita consumption of 0.42 kg and 1.19 kg of chicken meat per year in rural and urban areas, respectively (NSSO, 61<sup>st</sup> Quinquennial Round). Given the high per capita disposal income of Rs 78690 (Economic Survey, 2009-10) and high income elasticity of demand, the demand for poultry products has been rising consistently. To cater to the needs of consumers in the National Capital Region (NCR) Delhi, the marketing structure of perishable items like poultry products has evolved slowly and matured over time. Presently, marketing of broilers/poultry meat in the NCR Delhi takes place in two distinct types of markets, viz. organized or high-end elite markets (shopping malls, organized multi-product retailers) of Gurgaon and New Delhi and the unorganized or primarily wet markets (exclusive chicken dressers, meat retailers shops, etc.), especially in the old Delhi, conventional markets and peri-urban areas. The organized poultry markets are characterized by those supported by modern management tools and professionally manned in a multi-product environment, retailing commercially processed, packaged and branded meat products, essentially frozen. Packaging, branding, presentation and hygiene, etc. are accorded very high priority in the organized retailing formats. On the contrary, the unorganized poultry markets comprise mostly road-side shops/vendors located in the sub-urban areas or in the vicinity of residential areas catering to local population selling or specializing in a single line product. These road-side poultry meat vendors/shops/retailers sell mostly freshly slaughtered chicken and cater to the preferences of their 'local' customers. Unlike organized retailing, in this kind of markets, packing, branding, presentation and hygiene, etc. are accorded relatively lower priority.

With the advent of globalized markets in mid-1990s, the markets have started evolving and a sea change has been observed not only in the product range offered but also in the packaging and format of sales. The present study was undertaken with a view to compare

the organized and unorganized marketing of broilers co-existing in the NCR Delhi, catering to different classes of customers. The specific objectives of the study were: (i) comparing the channels for marketing in the supply chain of packaged poultry meat products (in organized retailing) with those of unpackaged products (in unorganized markets) in terms of marketing cost, margins and price spread in the study area, and (ii) identification of constraints in promotion of packaged poultry meat products.

### Data and Methodology

For the study, high-end elite markets of New Delhi/Gurgaon were chosen to represent the organized markets for broilers/poultry meat. The road-side chicken vendors, dressers and small exclusive chicken meat shops, especially in the old Delhi area, were chosen as representative of unorganized markets. The study was based on secondary as well as primary data collected from different market functionaries, viz., poultry producers, commission agents, processors/dressers, suppliers, wholesalers, retailers and consumers involved in the performance of marketing of broilers/poultry meat in the two types of markets. A minimum of 10 respondents per market functionary were selected randomly in the two types of markets and interviewed for obtaining primary data on schedules especially developed and tested for the purpose. The primary data were obtained during the year 2008-09.

For studying channels of marketing, the wholesale regulated poultry market of Ghazipur, one of the largest regulated poultry market in northern India and serving as the nerve supply centre of broilers/ chicken meat for the NCR Delhi, was selected. On an average, over 2 lakh birds were traded daily in the NCR Delhi at Ghazipur Poultry Market alone accounting for about 50 per cent of the chicken sold. Besides broilers, other poultry species such as guinea fowls, *desi* and culled broilers breeders /layers were also traded. Various market functionaries/ intermediaries were identified in the broiler/poultry meat supply chain and data were obtained from each of them in order to workout marketing cost, price spread, market margins and efficiency, etc. in each of the identified channels. Simple tabular and standard analytical tools were used to analyze the data. The marketing efficiency was worked out by applying methodology suggested by Acharya and Agarwal (2007).

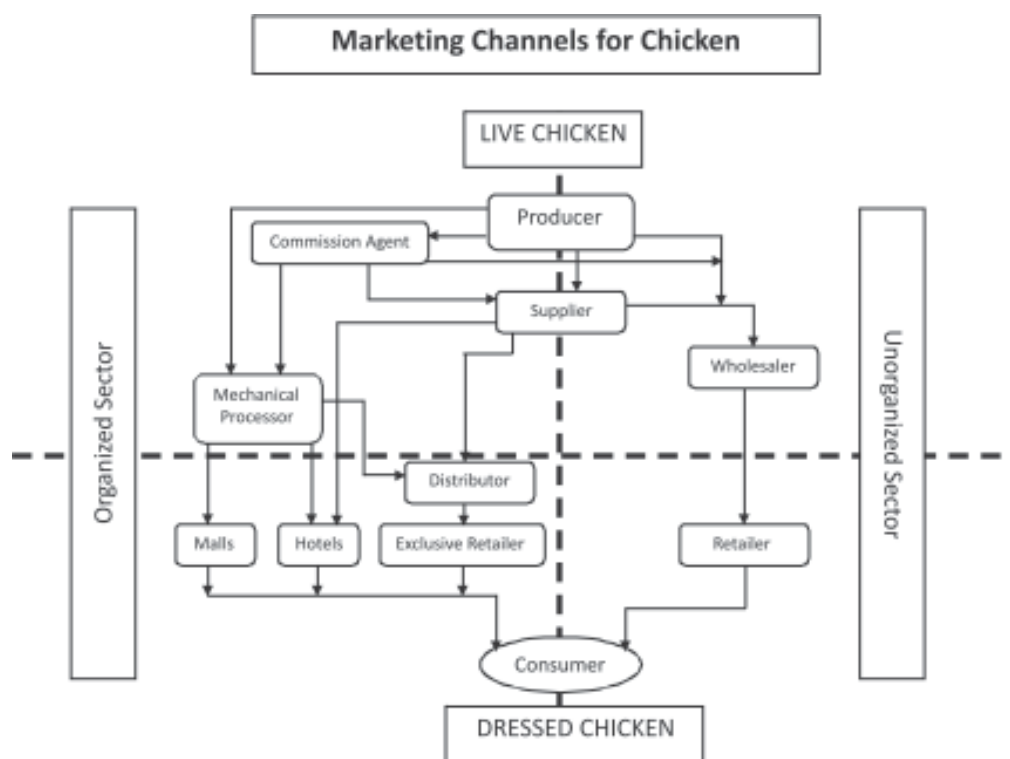


Figure 1. Broiler supply chain in organized and unorganized markets in the NCR Delhi

## Results and Discussion

The broilers/chicken meat supply chain as prevalent in the organized and unorganized sectors in the NCR Delhi markets is depicted in Figure 1. For the ease of presentation, the whole system of broiler marketing has been subdivided into four quadrants. The horizontal dotted line (Figure 1) divides the market into live chicken and dressed chicken markets, whereas the vertical dotted line divides the market into organized and unorganized markets.

### Marketing Costs, Margin, Price Spread and Efficiency in Unorganized Markets in NCR Delhi

Based on the primary survey conducted on the road-side chicken vendors, dressers and small exclusive chicken meat shops especially in the old Delhi area representing unorganized chicken markets, the following channels were identified in the Ghazipur Poultry Market and the NCR Delhi for unorganized marketing of broilers in the supply chain:

i. Producer-Wholesaler- Dresser-cum-Retailer - Consumer

ii. Producer-Supplier-Wholesaler- Dresser-cum-Retailer -Consumer

iii. Producer- Commission agent-Supplier-Wholesaler- Dresser-cum-Retailer -Consumer

On the basis of the data obtained from various market functionaries involved, the marketing cost, margins, price spread and efficiency in various channels of the supply chain were worked out and have been presented in Table 1. The expenses on handling (loading/unloading/weighing, etc.), transport, electricity/ phone bill, feed and water, etc. accounted for 27-29 per cent of the total marketing cost of broilers. The labour wages (both in cash and kind) for manual chicken processing were Rs 2700/t, which accounted for 21-26 per cent of the total broiler marketing cost. Commission and market fee accounted for 21-23 per cent in different channels of marketing. The broiler marketing cost was the lowest in Channel-I (Rs 10480/t), followed by Channel-II (Rs 11350/t) and Channel-III (Rs 12960/t). Low body weight, shrinkage and high mortality losses during summer season were identified as the major constraints in broilers marketing in addition to the rampant corruption in transportation of broilers through the NCR Delhi.

**Table 1. Average marketing cost in different channels in the broilers supply chain in the NCR Delhi (unorganized sector)**  
(Rs/t live weight)

Particulars	Channel-I	Channel -II	Channel -III
Labour (handling, weighing, loading & unloading at producers' level)	440 (4%)	460 (4%)	500 (4%)
Transportation cost including mortality losses	760 (7%)	810 (7%)	1060 (8%)
Commission charges, market fee, octorai, taxes, etc.	2300 (22%)	2560 (23%)	2730 (21%)
Overhead charges (shop rent, storage, etc.)	520 (5%)	800 (7%)	1180 (9%)
Expenses on labour, transport, electricity/ phone bill, feed and water, etc.	2980 (29%)	3150 (27%)	3750 (29%)
Expenses on labour (both in cash and kind) for manual processing	2700 (26%)	2700 (24%)	2700 (21%)
Miscellaneous expenses	780 (7%)	870 (8%)	1040 (8%)
<b>Total marketing cost</b>	<b>10480 (100%)</b>	<b>11350 (100 %)</b>	<b>12960 (100%)</b>

Note: Figures within the parentheses are the percentages of respective values

**Table 2. Average market margins, price spread and efficiency in the broiler supply chain in the NCR Delhi (unorganized sector)**

Particulars	Channel-I	Channel -II	Channel -III
Producer's price	66500 (62%)	67750 (56%)	67150 (51%)
Marketing cost	10480 (10%)	11350 (10%)	12960 (10%)
Marketing margin	30220 (28%)	39900 (34%)	51890 (39%)
Consumer's price	107200 (100%)	119000 (100%)	132000 (100%)
Marketing efficiency index	1.63	1.30	1.03
Price spread	40700	51250	64850

Note: Figures within the parentheses are the percentages of respective values

The marketing margins, price spread and efficiency index worked out for the three prominent marketing channels in the supply chain in the unorganized sector in the NCR Delhi (Table 2) revealed that in all the three channels, share of marketing cost in consumer's rupee was 10 per cent. The producers' price in Channels II and III was almost same (in absolute terms). The lowest producers' price in Channel-I was attributed to avoidance of market fee and commission by the producers who marketed their produce directly without entering the Ghazipur regulated poultry market. In Channel-I, the share of marketing margin in consumers' price was lowest (28%), followed by Channels II (34%) and III (39%). Accordingly, the marketing efficiency index for Channel-I was estimated as 1.63, the highest amongst all the channels, indicating the most efficient channel in the supply chain for broilers in the NCR

Delhi. The study revealed that the consumers received freshly slaughtered and dressed chicken at relatively higher prices in Channels-II and III involved in broiler marketing. The efficiency in Channel-I was primarily attributed to pooling/sharing of transportation and handling charges by a number of dresser-cum-retailers operating in the same locality/market.

#### **Marketing Costs, Margin, Price Spread and Efficiency in Organized Markets in NCR Delhi**

Frozen, ready-to-cook and value-added processed poultry products such as chicken garlic fingers, chicken nuggets, hot-dogs, sausages and ready-to-cook chicken etc. were marketed at shopping malls and specialized retail chain outlets (such as *More, Reliance Fresh, 365*, etc.) constituting organized retailing in the NCR Delhi. The processed chicken products sold through

organized market were in fact branded products of various large poultry business houses and integrators, viz. Venky, Sugna, Godrej, etc. Some imported value-added processed poultry products were also marketed through these outlets.

The following channels were identified in the Ghazipur Poultry Market and the NCR Delhi for organized marketing of frozen chicken meat:

- i. Producer - Commission agent- Supplier-Distributor- Shopping Malls/Hotels/Retailers-Consumer
- ii. Producer-Commission agent- Mechanical Processor-Distributor- Shopping Malls/ Hotels/ Exclusive Retailers-Consumer
- iii. Producer - Mechanical Processor- Shopping Malls/ Hotels/Exclusive Retailers- -Consumer

The marketing cost, margins, price spread and efficiency in the above channels for frozen chicken meat were worked out. The marketing costs estimated for various marketing functions involved in the broiler supply chain are given in Table 3. The expenses on handling (loading/unloading/weighing, etc.), transport, electricity/ phone bill, feed and water, etc. accounted for 24-25 per cent of the total marketing cost of broilers in all the channels. The labour expenses (both in cash and kind) towards manual chicken dressing and processing were Rs 2700/ t and accounted for 18-22 per cent, followed by commission and market fee contributing 19-20 per cent of total marketing cost in

different channels. The packaging and refrigeration cost for frozen meat accounted for 12-14 per cent. The marketing cost of frozen chicken meat in Channel-I was lowest (Rs 12150/t), followed by Channel-II (Rs 13110/t) and Channel-III (Rs 14780/t). Therefore, the Channel-I was found to be most efficient with an efficiency index of 1.63. Erratic power supply, power cut and lack of refrigerated transportation facility, poor monitoring of food safety and quality norms in manual processing, especially during summer season, were identified as major constraints in frozen chicken meat marketing.

The marketing margin, price spread and efficiency estimated for three important channels in the supply chain for frozen poultry meat in NCR Delhi (Table 4) revealed that in Channel-II and III, the share of marketing cost in consumer's rupee was 7 per cent, whereas in Channel-I, it was 8 per cent. The share of marketing margins in consumer's rupee ranged from 49 per cent to 59 per cent, whereas producers' share in consumer's rupee ranged from 34 per cent to 43 per cent in different channels. The marketing efficiency index was estimated at 0.75 for Channel-I, which was found the most efficient channel for frozen chicken in the NCR Delhi.

A comparison of most efficient channels in the organized and unorganized sectors for marketing of chicken in the boiler supply chain is depicted in Table 5. It is evident that the producers reaped a larger share of consumer's rupee in the unorganized sector than

**Table 3. Average marketing cost in different channels in the broilers supply chain in the NCR Delhi (organized sector)**

(Rs/t live weight)

Particulars	Channel-I	Channel -II	Channel -III
Labour (handling, weighing, loading and unloading at producers' level)	440 (4%)	460 (3%)	500 (3%)
Transportation cost and mortality losses	760 (6%)	810 (6%)	1060 (7%)
Commission , market fee, octorai etc.	2300 (19%)	2560 (20%)	2730 (19%)
Packaging and refrigeration cost	1670 (14%)	1760 (13%)	1820 (12%)
Overhead charges (shop rent, storage, etc.)	520 (4%)	800 (6%)	1180 (8%)
Recurring expenses (labour, electricity/ phone bill, etc.)	2980 (25%)	3150 (24%)	3750 (25%)
Expenses on labour (both in cash and kind) for manual processing	2700 (22%)	2700 (21%)	2700 (18%)
Miscellaneous expenses	780 (6%)	870 (7%)	1040 (7%)
<b>Total marketing cost</b>	<b>12150 (100%)</b>	<b>13110 (100 %)</b>	<b>14780 (100%)</b>

*Note:* Figures within the parentheses are the percentages of respective values



**Table 4. Market margins, price spread and efficiency for frozen broilers meat**

Particulars	(Rs / t live weight)		
	Channel-I	Channel -II	Channel -III
Producer's price	66500 (43%)	67750 (38%)	67150 (34%)
Marketing cost	12150 (8%)	13110 (7%)	14780 (7%)
Marketing margin	76350 (49%)	99140 (55%)	118070 (59%)
Consumer's price	155000 (100%)	180000 (100%)	200000 (100%)
Marketing efficiency index	0.75	0.60	0.51
Price spread	88500	112250	132850

Note: Figures within the parentheses are the percentages of respective values

**Table 5. A comparison of most efficient channels in organized and unorganized sectors for marketing of broilers/chicken in the NCR Delhi**

Particulars	Organized sector	Unorganized sector	Organized: Unorganized ratio
Producer's price	66500 (43%)	66500 (62%)	1.00
Marketing cost	12150 (8%)	10480 (10%)	1.16
Marketing margin	76350 (49%)	30220 (28%)	2.53
Consumer's price	155000 (100%)	107200 (100%)	1.45
Marketing efficiency index	0.75	1.63	-
Price spread	88500	40700	2.17

Note: Figures within the parentheses are the percentages of respective total values

organized sector. Although the marketing cost was only marginally higher in the organized marketing than in unorganized marketing, the price spread in the former was more than two-times as compared to the later. Hence, although consumers paid higher prices for frozen chicken meat in the organized marketing, the monetary benefits were not transferred to the producers as is reflected from the marketing margins which were almost 2.5-times in the organized marketing than in the unorganized marketing of poultry products. The study revealed that the most prominent channel in the supply chain for broilers marketing in the NCR Delhi was: Producer - Commission agent- Supplier-Distributor-Hotels/Retailers-Consumer.

### Broilers Processing and Value-addition through Manual Dressing

Over 70 per cent of the daily market arrivals of broilers in the Ghazipur Poultry Market were dressed in the manual dressing sheds constructed within the premises of the market. The dressing operations start early in the morning and are completed by noon every

day (barring Tuesdays and other national holidays when markets are closed) and were found to provide employment to over 5000 labourers. The manual dressing operation of chicken yielded some 20 products (Table 6) with virtually no slaughter waste. The percentage yield of each of the products on weight basis, their wholesale prices and total yield in value terms were worked out. Most of these products (or cutup parts) were sold by the dressers-cum-suppliers, whereas some low-value products (offal) were given to labourers as part of wages in kind. The labourers in turn either sold them in the markets in the slum areas or utilized for their own household consumption. The value addition through manual dressing of chicken was nearly 50 per cent on live weight basis.

The official fee charged for manual dressing in the dressing facility of the Ghazipur Poultry Market was Rs 2 per crate having 8-14 birds each. The average labour cost of manual dressing inclusive of wages paid to the labourers in cash and in kind in the form of poultry slaughter waste/by-products worked out to be Rs 2700/t, in contrast to the estimated mechanical dressing cost

**Table 6. Value addition through manual dressing of chicken in NCR Delhi**

Sl No.	Cutup parts / Offal	Percentage recovery on live wt basis (w/w)	Wholesale price of the product (Rs/kg)	Value per broiler of 1.5 kg (live wt basis)
1.	Thigh	10	150	22.50
2.	Leg	15	120	27.00
3.	Kalmi	10	140	21.00
4.	Breast	16	135	32.40
5.	Arms ( <i>baju</i> )	5.5	90	7.43
6.	Lolipop	4.75	120	8.55
7.	Khol (rib cage)	16	30	7.20
8.	Kanta	1	12	0.18
9.	Guddi	0.25	100	0.38
10.	Nali	4	20	1.20
11.	Heart, liver, lungs & gizzards ( <i>Pota</i> )	9.5	70	9.98
12.	<i>Narkhala</i> (trachea)	0.25	15	0.06
13.	Tail	0.50	40	0.30
14.	<i>Punja</i> (claws)	1.50	32	0.72
15.	Last wing ( <i>akhiri daina</i> )	0.50	30	0.23
16.	Neck skin	0.75	25	0.28
17.	Leg and breast skin	0.75	20	0.23
18.	Heads ( <i>Mundi</i> )	1.00	20	0.30
19.	Breast skin	0.75	30	0.34
20.	Intestines	0.75	10	0.11
Total value after dressing:		Rs 140.36 [@ Rs 93.58/kg]		

of Rs 6000/t on live weight basis in the mechanized processing plant contemplated to be installed in the Ghazipur Poultry Market. A comparison of mechanized processing vis-a-vis manual processing of broilers as cited by the respondents and market functionaries in the Ghazipur Poultry Market has been presented in Table 7.

Due to highly capital-intensive and labour-displacing nature of this trade, the plans to establish mechanized processing plant in the Ghazipur Poultry Market invited lot of resentment amongst most of the traders and market functionaries involved in the poultry trade. Moreover, the mechanized processing was cited to be less productive since dressing yield was likely to be only 65-70 per cent. Environmentally-safe disposal of the rest 30-35 per cent as slaughter waste also warranted additional investment for its further processing, thereby adding to the cost. The mechanical processing was also seen as providing employment to only a few highly skilled persons needed to operate the

plant, thereby depriving a large number of illiterate / semi-skilled workers earning their livelihood from manual processing of chicken.

## Conclusions

The study has revealed that there are three important channels each in the organized and the unorganized sectors for marketing of the broilers/ chicken meat in the NCR Delhi. The daily consumption of broilers in the NCR Delhi has been estimated to be over 2 lakh birds, of which over 50 per cent is supplied from the Ghazipur Regulated Poultry Market alone. Over 70 per cent of the daily arrivals of broilers in the Ghazipur market are dressed manually in the dressing sheds constructed for the purpose. The rest is traded and transported live to various markets in the NCR Delhi. The chicken marketing cost has been estimated to be Rs 10480/t and Rs 12150/t in the most efficient channels in unorganized and organized markets, respectively in the NCR Delhi on live weight basis.

**Table 7. Mechanized processing vs manual dressing of broilers in NCR Delhi**

Particulars	Mechanized processing	Manual processing
Capital requirement	High	Low
Labour requirement	Low	High
Type of labour needed	High skilled (engineers, plant operators, etc.)	Mostly unskilled/semi- skilled, even illiterate
Water requirement	High	Low
No. of products recovered	A few (mainly legs and breasts)	Over 20 products each having a distinct market price
Cost of processing	Rs 9/broiler	Rs 2/crate (8-14 broilers)
Processing conditions	Highly hygienic	Unhygienic
Initial investment	Very high	Low
Electricity requirement	High	Low
Overhead cost	High	Low

Although the marketing cost is only marginally higher in the organized marketing than in the unorganized marketing, the price spread in the former (Rs 88500/-) has been found more than two-times than that in the later (Rs 40700/-). Due to high marketing margins in the organized marketing, the producer's share in consumer's rupee is substantially lower at 43 per cent as against 63 per cent in the unorganized marketing. The study has revealed that the most prominent channel in the supply chain for broilers marketing in the NCR Delhi is: Producer - Commission agent- Supplier-Distributor- Hotels/Retailers-Consumer. Erratic power supply, long power cuts and lack of refrigerated transportation facility, poor monitoring of food safety and quality norms in manual processing, rampant corruption in transportation of live chickens, etc. have been identified as the major constraints in marketing of broilers/chicken meat. The study has also assessed the pros and cons of manual dressing of broilers vis-à-vis mechanical processing and has estimated the cost of processing in the two systems. It has been observed that manual dressing of broilers is not only cheaper but also provides employment and livelihood to a large number of illiterate and/or semi-skilled workers. Hence, the study has suggested to improve and organize the manual dressing system so that the qualitative aspects and concerns about health and hygiene could also be addressed.

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