

Structure of Duck Egg and Meat Marketing System: The Case of Tamil Nadu (South India)

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Abstract: The monopoly power in the duck egg and meat market structure in Tamil Nadu, the fourth largest duck raising zone of India was analysed by means of Concentration Ratio (CR) and Hirschman-Herfindahl Index (H index) and in the absence of monopoly, Bain's classification was used to identify the prevailing structure of market. Five channels were identified to market eggs, while three for duck meat. However, the quantum of eggs and meat transacted was high in those channels with trader and wholesaler intermediaries. The 'trader' in the channels lent money and other inputs to the farmers, in turn receiving their produce. In the marketing of duck products, vertical integration was noticed, where a wholesaler or secondary wholesaler was also retailing his products. The 'H' index computed for eggs at farm level was 0.149, while CR was 0.11 indicating the absence of monopoly. The 'H' index and CR for duck meat were 0.163 and 0.1320, respectively. Despite the presence of atomistically competitive seller and buyer groups, the duck egg and meat marketing system in Tamil Nadu can be termed as 'Pure Competitive' considering the contributing factors such as product differentiation and the degree of market intelligence.

Key words: Duck egg and meat • market structure • concentration ratio • hirschman-herfindahl index • India

INTRODUCTION

Poultry farming in India has revolutionised as an immense industry from a backyard venture over the past three decades. Besides chicken, duck rearing is practised in India since time immemorial as a profitable traditional backyard enterprise. Although the duck production remains to be neglected by the research workers, development agencies and organised private sectors, still it continues to be the livelihood preposition of several poor rural farmers.

India has some inherent natural advantages for duck farming. A 4000 kilometer long coastline and extensive water shed areas in several parts of the country offer excellent natural habitat of ducks. The nine million duck population in 1972 has increased slowly to about ten millions in 1984 and profusely to about 29.96 millions in 2003, which is 6.13 per cent of total poultry population in the country. Although the total population has increased from 1972 to 2003, it registered a negative annual growth rate of -0.52 per cent during the period between 1997 and 2003 [1].

In fact, the duck products (egg and meat) are the important non-conventional sources of food in some parts

of Southern India. Currently, the cost of conventional meat (mutton, chevon and chicken) is rising at an alarming rate due to shortage of supply to retail shops as a result of mounting cost of resources at farm level. Hence, the products from duck like duck eggs and meat have the greater potential for capturing the retail market or for competing with other meat products.

Despite significant growth, duck raising continue to suffer mainly of problems arising from beyond the farm gate and before the product reaches the consumer's plate. Marketing of duck products is associated with a unique set of conditions which make it highly risky that include the perishable nature of the produce handled and prevalence of relative imperfection in the marketing mechanism. Therefore, it is essential to create a sound marketing environment not only to provide incentive price to the producer but also to make available the duck products at reasonable price to the consumer. Detailed research based information on market structure would suffice the formulation of appropriate market development policies.

Market structure was referred to those of characteristics of organization of the market which influence the nature of competition and pricing in the

market and conduct of business firms [2]. The prices charged by firms for their products, the nature and extent of their research and development activities, the type of product advertising and the selling techniques that firms employ are all influenced by the structure of markets in which they deal [3]. The conduct of firms in a market environment is heavily influenced by certain features of the market. These characteristics are several and unique to the product and institution involved. Knowledge on existing organisational features (market structure) will assist the planners and policy makers to develop need based market development programmes.

MATERIALS AND METHODS

In this study, an attempt was made to analyse the duck egg and meat markets structure in Tamil Nadu, the fourth largest duck raising zone of India. From the published sources of population data and the officials of Department of Animal Husbandry, 11 districts of the 15 undivided districts that existed as on 1974 were identified to raise ducks. 50 duck farmers (Producer) and 10 market intermediaries from each duck rearing district were selected using simple random sampling technique. Relevant data were collected from the sample duck farmers and duck egg and meat dealers, so as to achieve the objectives of the study. The data were collected by personal interview method using two different interview schedules prepared and pilot-tested separately for producers and intermediaries. Care was taken to obtain reliable data from the respondents. In addition, traders, wholesalers and retailers of ten each were selected randomly for this study. In this study, traders are like pre-harvest contractors of agricultural produce, extending credit to the farmers for the feed and medicine and in turn purchase their eggs/live bird for meat. The market structure was analysed by means of the following tools to assess the monopoly power in the system, if any:

Concentration Ratio (CR): Concentration Ratio (CR) was calculated as per the following expression given by Singh [4].

$$CR = \sum_{i=1}^m P_i; m \geq 1$$

Where,

P_i denotes the share of the i^{th} farm arranged in descending order and m is the number of largest farms under consideration. Clearly, $0 < CR < 1$ and for a given m , higher the value of CR, greater will be the market concentration or monopoly power in the industry.

Hirschman-Herfindahl Index (H index):

$$H = \sum_{i=1}^m (P_i)^2$$

Where,

$P_i = \frac{q_i}{Q}$, q_i is the output of the i^{th} farm arranged in

descending order and Q is the total output of all the farms and n is the total number of farms. This weighted index of market (output) share with weights being the shares themselves attains the value of 'unity' in the case of monopoly and approaches 'zero' as the number of farms with identical shares increases.

As described by Kathiravan *et al.* [5], the above two indices were used to test the monopoly power of the market system and in the absence of monopoly; Bain's [6] classification was used to identify the prevailing structure of market.

Bain [6] classified the market structure on the basis of volume of business and on the basis of firms' share in the total business. Accordingly, if the top four firms controlled 75-100 percent of the business of a product, it was considered as a highly concentrated oligopoly; for 50-75 percent it was recorded as moderately concentrated oligopoly; for 25-50 per cent it was called as slightly concentrated oligopoly; and for less than 25 per cent of the business, it was referred as atomistically competitive.

Duck egg marketing system

A. Channels in duck egg marketing: In the marketing studies, it is highly imperative to identify the channel or path through which the produce passes from the producer to the consumer. The channel of distribution constitutes the course taken in transfer of title to a commodity. In the study of marketing channels for duck egg production, five channels were identified through which the duck eggs were moved from the producer (farmer) to the ultimate consumer (including consumers in Kerala). They are as follows:

- Channel I: Producer-Trader-Wholesaler (Consumption centre)-Retailer-Consumer
- Channel II: Producer-Trader-Retailer (Consumption centre)-Consumer
- Channel III: Producer-Wholesaler-Secondary WS (Consumption centre)-Retailer-Consumer
- Channel IV: Producer-Wholesaler-Retailer (Consumption centre)-Consumer
- Channel V: Producer-Consumer

Of the five channels, the quantum of eggs transacted through first channel was high while through fifth channel was very low or negligible. The 'trader' in the channels was like a preharvest contractor for crop produce, who lended money and other inputs to the farmers in turn receiving their produce. In the marketing of duck eggs, vertical integration was noticed in many places where a wholesaler or secondary wholesaler was also retailing his products.

Producers brought their eggs from farm to trader/wholesaler shop in wire or bamboo baskets carried through bus or bicycles. The duck eggs were packed in bamboo or wooden boxes using layers of paddy straw as shock absorbent. In some places, eggs are packed in paper and plastic filler flats and then kept in cardboard boxes for further transport. They were transported to distant areas through rail, bus or lorries. No cooled wagon was used for this purpose.

B. Market structure for duck egg

Degree of sellers' concentration: The duck egg market structure in Tamil Nadu was analysed for the presence of monopoly if any, by means of concentration ratio and Hirschman Herfindahl Index.

i) Concentration Ratio (CR): The four farms concentration ratio, i.e. the value of CR for $m = 4$, as worked out in duck egg marketing at farm level was 0.11, showing that the share of four largest farms in total output of ducks was 11 per cent.

ii) Hirschman Herfindahl Index (H index): The 'H' value as computed for duck egg marketing at farm level for 100 farms was 0.149 or 14.9 per cent. These rather low values of CR and H indicated the lack of monopoly in production and marketing of duck eggs at farm level which was similar to the results obtained by Kathiravan *et al.* [4] in Chicken egg marketing.

iii) Bain's classification: To estimate sellers (producers) concentration in duck egg market in Tamil Nadu, random checks were carried out throughout the year. Out of total supply of duck eggs in a year, top four farms produced and transacted about 11 per cent. Therefore, as per Bain's classification of market structure, the farmers could be said to constitute an 'atomistically competitive market'.

Degree of buyers' concentration

Marketing stage 1: (Producer to trader or wholesaler): There were more than 100 traders and 70 wholesalers operating in study area. The size of handling in a month varies from 10,000 eggs to 70,000 eggs among these firms. These traders and wholesalers procured eggs from

producers and distributed to wholesalers or secondary wholesalers of consumption centres through lorries. At this stage of marketing there are large number of sellers and also buyers.

In this study, out of 120 traders and 80 wholesalers enquired, the top 4 firms controlled only 16 per cent of total duck eggs transacted. Therefore, as per Bain's classification of market structure, the traders and wholesalers in Tamil Nadu constitute an 'atomistically competitive group'.

Degree of product differentiation: There is no product differentiation among duck eggs. However, the duck eggs may well be substituted for chicken eggs. This forms the basis for competitive market.

Condition of entry into/ exit out of the market and market intelligence: As there was no control over the entry into/ exit out of the market or business, this condition leads to the competitive market structure. As the duck egg dealers were fully aware of the market situation, the price fixation was done by them arbitrarily for the reasons that the farmers are debtors.

Therefore, considering the appearance of atomistically competitive seller and buyer groups, product differentiation and the degree of market intelligence, duck egg market in Tamil Nadu was considered as 'Pure competitive market'.

Duck meat marketing system

A. Channels in duck meat marketing: Only live drakes and spent ducks are sold for meat purpose, unlike broiler chicken which was usually sold as live bird, dressed and/ or frozen meat. Though duck products are available in large quantity, their consumption was mainly in the adjacent state, Kerala which could be attributed to enormous availability of chicken products in Tamil Nadu.

Three channels were identified in marketing of duck meat. They are as follows;

Channel I: Producer-Trader or Wholesaler-Retailer (Consumption centre)-Consumer

Channel II: Producer-Retailer-Consumer

Channel III: Producer-Consumer

Of the above three channels, Channel I handled large quantum of duck meat while Channel III transacted a negligible or meager quantity.

B. Market structure for duck meat

Degree of sellers' concentration: The duck meat market structure in Tamil Nadu was also analysed for the presence of monopoly if any, by means of concentration ratio and Hirschman Herfindahl Index.

i) Concentration Ratio (CR): The four farms concentration ratio, i.e. the value of CR for $m = 4$, as worked out in duck meat marketing at farm level was 0.132, indicating the share of four largest farms in total output of ducks as 13.2 per cent.

ii) Hirschman Herfindahl Index (H index): The 'H' value was computed as 0.163 or 16.3 per cent for duck meat marketing at farm level for 100 farms.

The values for CR and H were low indicating the lack of monopoly in production and marketing of ducks at farm level which was similar to the results obtained by Singh [4] in broiler marketing.

iii) Bain's classification: Random checks were carried out to estimate sellers (producers) concentration in duck meat market in Tamil Nadu. Out of total supply of duck meat in a year, top four farms produced and transacted about 13.20 per cent. Therefore, as per Bain's classification of market structure, the farmers could be said to constitute an 'atomistically competitive market'.

Degree of buyers' concentration

Marketing stage 1: (Producer to trader or wholesaler):

There were more than 100 traders and 70 wholesalers operating in study area. These traders and wholesalers procured live birds from producers and distributed to wholesalers or secondary wholesalers of consumption centres through lorries. At this stage of marketing there are large number of sellers and also buyers.

In this study, out of 120 traders and 80 wholesalers enquired, the top 4 firms controlled only 18.20 per cent of total ducks transacted. Therefore, as per Bain's classification of market structure, the traders and wholesalers in Tamil Nadu constitute an 'atomistically competitive group'.

Degree of product differentiation: There is no product differentiation among duck meat. However, the duck meat may well be substituted for chicken meat. This forms the basis for competitive market.

Condition of entry into/ exit out of the market and market intelligence: Only competitive market structure existed in Tamil Nadu as there was no control over the entry into/ exit out of the market or business.

Hence, marketing of duck meat in Tamil Nadu was found to be 'Pure competitive market' considering the

factors such as appearance of atomistically competitive seller and buyer groups, product differentiation and the degree of market intelligence.

SUMMARY AND CONCLUSION

Duck eggs were moved from farm gate to consumer plate through five alternative marketing channels, while the duck meat was through three channels. However, the quantum of eggs and meat (includes live birds) transacted was high in those channels with trader and wholesaler intermediaries, as the marketing required huge investment and business tactics. The 'trader' in the channels acted like a preharvest contractor for crop produce, who lends money and other inputs to the farmers in turn receiving their produce. In the marketing of duck products, vertical integration was noticed in many places where a wholesaler or secondary wholesaler was also retailing his products.

Despite the presence of atomistically competitive seller and buyer groups, the duck egg and meat marketing system in Tamil Nadu can be termed as 'Pure Competitive' considering the contributing factors such as product differentiation and the degree of market intelligence.

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