Chapter 6

Chhana Consumption in Kolkata

6.0 Introduction

Bengal has played a pioneering role in the domain of sweets and confectioneries. Different varieties of sweets, namely, *sandesh, rasogolla* and fried sweets, are very popular in this part of the country. *Chhana* is base material for all these variety of sweets. *Chhana* was invented out of sheer necessity. During earlier days, as liquid milk consumption was not in practice, milkmen in Bengal were left with plenty of unsold milk. So, the unsold milk used to turn sour and form *chhana*. To make this *chhana* palatable, sweets like molasses and sugar were mixed with it and variety of sweets got invented.

Kolkata, because of its high population, is a major market of *chhana* based sweets. Sweet-making is one of the oldest businesses in Calcutta, striving for last one hundred and fifty years. The nineteenth century renaissance in Bengal brought about a dramatic change in customs, culture and education of Bengalis in Calcutta. During this century, Bengalis experienced a change in their food habits too. Bread-eating got an honour of a 'progressive activity' to many enlightened Bengalis. People of Bengal are traditionally sweet lovers, and have always been known for their particular weakness for sweets; however, with the influence of renaissance, creativity in sweet making and its artistic presentation took center stage. This attracted innovative minds to start business of sweet making and selling. With time sweet making business went on flourishing and made the city sweet capital of the country.

*Chhana* is a principal ingredient of sweet industry of Kolkata. *Chhana* required by sweet industry of Kolkata is either supplied by the *chhana* manufacturing growth centers of adjoining districts or made in-house by sweet makers. It was noted in previous chapter that age old practices are still in vogue for *chhana* manufacturing in villages of Hooghly
and North 24 Parganas and its distribution to sweet industry of Kolkata. However, due to changing consumer demand, retailing of sweet in Kolkata market is transforming at a fast pace. Visible changes are taking place in the looks, interiors and furnishings of sweet shops, product qualities, types, packaging etc. So, there exists a gap between the supply side and demand side in this sector. Supply of chhana, the base material of most of these sweets, is still entirely dependent on age-old practices. There are many deficiencies in process of manufacturing and it is high time for introduction of modern technology to the trade.

The objectives set for the study in Chapter 1 with respect to the chhana consumption in Kolkata are being dealt with hereunder in a systematic manner. This chapter encompasses profile of Kolkata and various traits of sweet business of the city to understand demand of chhana in Kolkata market in both qualitative and quantitative terms. The sweet shops of city have been studied in detail to understand the scale of operation, product profile and pricing, packaging, level of technology, quality and quantity of chhana handled. The working of chhana markets of Kolkata and the role of apex level sweet makers' association in the trade has also been analyzed. The present status of mechanization of in-house chhana manufacturing and potential demand for mechanized chhana has been studied to get an insight into the subject in accordance with the objectives.

6.1 Profile of Kolkata

City of Kolkata (earlier Calcutta) stands on the Eastern Bank of River Ganges. The tail end of river Ganges flows by the side of Kolkata before it reaches Bay of Bengal about 180 kilometer downstream from Kolkata. The city, called by the British Raj as The Jewel of the East, remained its capital till 1911. Kolkata is now the capital of West Bengal, a state of India. Kalikata is derived from the Bengali word Kalikshetra meaning "Ground of the Goddess Kali." Some say the city's name is derived from the location of its original settlement on the bank of a canal (khal).
Map 5 – City of Kolkata

Source: Calcuttaweb, 2010
The city of Kolkata was created about three hundred and twenty years back by Britisher Job Charnock of East India Company by amalgamating three villages, namely Sutanuti, Gobindapur and Kolkata, which he bought from the native landlords. With time the city expanded to a much wider region. The Kolkata district is bordered by district North 24 Parganas in north and east, South 24 Parganas in the south and Howrah in the west. Kolkata district is governed by the Kolkata Metropolitan Corporation. However, greater Kolkata is spread over a larger area (map 5), which includes Kolkata and parts of North 24 Parganas, Nadia, South 24 Parganas, Hooghly and Howrah. Maximum temperature rises during the summer months of May-June up to 24 – 42 °C and the minimum temperature falls during winter months of December - January up to 8 – 26 °C on an average. Climate is humid varying from 85 - 65 per cent relative humidity during summer, however it is pleasant in winter. From June to September average rainfall in Kolkata is 158 cm.

Kolkata district has a total area of 185 square kilometer within the Corporation Area, and the greater Kolkata a total area of 1480 square kilometer. According to census 2001, the population of Kolkata district is 4572876, which is about 5.7 per cent of total population of the state. The sex ratio in district is 829 females per 1000 males. However, the population of greater Kolkata is 13216546, which is about 16.5 per cent of the total population of the state. The sex ratio of the greater Kolkata is 869 females per 1000 males. The district has 100 per cent urban population. The city has a very high population density of 24760 per square kilometer. Kolkata metropolitan area is divided among one hundred and forty one administrative wards.

6.2 Sweetmeat Industry in Kolkata

Sweet making is one of the oldest businesses of Kolkata. Variety of sweets are prepared and sold in this city to cater sweet palate of the consumers. Majority of sweets manufactured are chhana based here. The sweetshops across the city produce a certain portion of total chhana consumed in the sweetmeat industry, whereas the rest of the
*chhana* is purchased from the *chhana* market traders or vendors selling *chhana* produced in the hinterland areas of adjoining districts of West Bengal.

Photograph 16: Typical Sweetshop of Kolkata – Small

![Typical Sweetshop of Kolkata – Small](image)

Photograph 17: Typical Sweetshop of Kolkata – Big

![Typical Sweetshop of Kolkata – Big](image)
The size of sweetshops in terms of their sales volume varies widely in city, which gets reflected in their outlet design and facilities. Two extreme types of outlet are depicted in photographs 16 and 17, one small and another big sweetshop outlet differing distinctly in their get up and amenities. During the study, information has been collected from the sweetshops across the city to understand key features of sweetmeat industry with primary objective of getting an insight on chhana consumption pattern by sweet industry.

6.2.1 Distribution of Sweetshops by Chhana Usage

It was observed during study that though chhana based sweets are major product of all sweetshops of Kolkata, the chhana usage varies with sales volume of shops. Attempt has been made to classify sweetmeat shops of city on the basis of average per day chhana usage. All sample sweetshops have been categorized in six broad classes, namely, $\leq 5$ kg, 6 to 10 kg, 11 to 25 kg, 26 to 50 kg, 51 to 100 kg and $> 100$ kg per day chhana usage. The number of sample sweetshops under different categories is presented in table 26 and percentage of sample sweetshops under different categories is presented in chart 21.

Table 26 : Number of Sample Sweetshops under Different Categories of Average Daily Chhana Usage

<table>
<thead>
<tr>
<th>Average per day chhana usage</th>
<th>Number of sample shops</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\leq 5$</td>
<td>250</td>
</tr>
<tr>
<td>6 to 10</td>
<td>146</td>
</tr>
<tr>
<td>11 to 25</td>
<td>25</td>
</tr>
<tr>
<td>26 to 50</td>
<td>15</td>
</tr>
<tr>
<td>51 to 100</td>
<td>9</td>
</tr>
<tr>
<td>$&gt; 100$</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>450</td>
</tr>
</tbody>
</table>

Source: Primary Data

The chart shows that more than half of sample sweetshops in Kolkata consumed on an average less than 5 kg of chhana and more than 30 per cent of the sample sweetshops daily consumed 6 to 10 kg of chhana. It can also be observed that number of big
sweetshops using more than 26 kg of chhana a day is quite small, constituting only 6 per cent of sample shops. Therefore, majority of sweetmeat shops are small shops catering to a specific locality and are not known by their name in other areas and locality, which clearly indicates the unorganized nature of the sweet business in Kolkata.

![Chart 21: Percentage of Sample Sweetshops under Different Categories of Average Daily Chhana Usage](source)

Source: Primary Data

### 6.2.2 Distribution of Sweetshops by Number of Outlets

During study, attempt has been made to classify sample sweetshops on the basis of their number of outlets. All sample sweetshops have been categorized in six broad classes, namely, 1, 2, 3, 4, 5 and > 5 number of outlets. The number of sample sweetshops under different categories is presented in table 27 and the percentage of sample sweetshops under different categories is presented in chart 22.

**Table 27: Number of Sample Sweetshops under Different Categories of Outlet Numbers**

<table>
<thead>
<tr>
<th>Number of outlets</th>
<th>Number of sample shops</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>389</td>
</tr>
<tr>
<td>2</td>
<td>35</td>
</tr>
<tr>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>&gt; 5</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>450</td>
</tr>
</tbody>
</table>

Source: Primary Data
The chart reveals that about 86 percent of sample sweetshops have single outlets, while about 8 percent have two outlets and only 6 percent have more than two outlets. This indicates that sweet business in city is quite scattered among individual entrepreneurs and phenomenon of centralized production and selling through number of branches under single brand name is still in a very nascent stage. Photographs of outlets of four big branded sweetshops of the city with more than one outlet are presented in photographs 18 – 21. Balaram Mullick & Radharaman Mullick is 125 years old sweet house and very popular in southern part of the city with 3 outlets. Nobin Chandra Das and Bhim Chandra Nag are pioneer of rasogolla and sandesh, respectively, and also grown up with times. Hindusthan Sweets, an ISO 9001:2000 certified company is comparatively new in sweet business in Kolkata, but has taken several new initiatives to cope up with the changing consumer preferences.

6.2.3 Chhana Utilization Pattern

Chhana is principal ingredient used for preparation of a variety of sweets in Bengal. In fact, it is the reason why any chhana-based sweet prepared outside Bengal is commonly
Photograph 18: Outlet of Big Branded Sweet – Balaram Mullick & Radharaman Mullick

Photograph 19: Outlet of Big Branded Sweet – Nobin Chandra Das
Photograph 20: Outlet of Big Branded Sweet – Bhim Chandra Nag

Photograph 21: Outlet of Big Branded Sweet – Hindusthan Sweets
termed as “Bengali-sweets”. During this study, attempt has been made to understand the utilization pattern of different types of chhana for different variety of sweets by sweet makers.

6.2.3.1 Chhana Utilization in Different Variety of Sweets

A wide variety of chhana based sweets available in city shops demonstrated continuous innovations taking place in this sector. The different variety of chhana based sweets sold in typical sweetshops in Kolkata has been captured in photographs 22 (a) and (b). However, these sweets can be broadly classified in three categories, namely, rasogolla, sandesh and fried chhana sweets. Different varieties of sweets under these three categories are described below. Few examples of different chhana sweets are shown in photograph 23.

- Rasogolla: This is a spherical shaped sweet which is cooked in sugar syrup and subsequently stored and served in the syrup. Rasogolla is prepared from only cow milk chhana, as the typical body and texture of Rasogolla cannot be obtained from buffalo milk or mixed milk chhana. Rasogolla is the most popular Bengali sweet, which is again classified into the following types:
  - Sponge Rasogolla – This has a typical spongy body and smooth texture. This is mainly popular in southern part of the city. Preparation of Sponge Rasogolla needs freshly prepared hot chhana, in order to get the typical spongy body. Hence, for making sponge rasogolla, only self prepared chhana is used. This variety is mainly popular among the upwardly consumers, especially in the southern part of the city.
  - Soft Rasogolla – This is also called “Narom Rasogolla”, which has a soft body and this is mainly popular in the northern part of the city. Soft rasogolla can be made from either self prepared or purchased chhana. This variety has mass appeal, especially among the consumers in the northern part of the city.
- Others like Rajbhog, Rasmalai, etc. – These are *chhana* based sweets that are stored in thickened milk with added sugar. The balls are processed like *rasogolla* and subsequently stored in thickened milk. These are also made from either self-prepared or purchased *chhana*.

  - *Sandesh*: It is a *chhana* based sweet with a somewhat firm body and a smooth texture. This is prepared by cooking and kneading together a mix of *chhana* and sugar and may also contain added colour and flavour. Both cow milk and buffalo

Photograph 22 (a): Varieties of Sweets in A Typical Sweetshop - 1

Photograph 22 (b): Varieties of Sweets in A Typical Sweetshop – 2
milk chhana are used for sandesh preparation. This comes in a variety of fancy shapes. Sandesh is mainly classified into two types:

- Soft Sandesh or “Naram Pak” – This is a soft variety of sandesh which can be made only from fresh chhana which is usually self prepared.
- Hard Sandesh or "Karha Pak" - This is a drier and harder variety made from old chhana. This is normal quality sandesh and has a longer shelf-life than soft sandesh. In hard variety of sandesh, sometimes sugar is replaced with date jiggery (nalen gurh).

- Fried Chhanna Sweets: These sweets are fried in vegetable oil after cooking and molding. In some varieties, these are dipped in sugar syrup after frying. Fried chhana sweets are either prepared from stored chhana or purchased chhana. Typical examples of fried chhana sweets are pantua, chhanar jilipi, nikuti, chunchum, ledikenny etc.

During the study, information was gathered on quantum of sales volume of above three broad categories of chhana based sweets. It was found that quantum of sales of rasogolla and sandesh types of sweets were almost equal, while that of fried sweets was slightly less as compared to other two types. The proportion of sales volume of different category of sweets was as follows:

Rasogolla : Sandesh : Fried Chhana Sweets :: 4:4:3

6.2.3.2 Seasonal Variation in Chhana Consumption

Demand for sweets varies widely during different period of the year leading to wide range of seasonal variation in chhana consumption by the sweetshops in Kolkata. The chhana consumption calendar in Kolkata is depicted in chart 23. Chhana utilization for sweet making reaches its peak during festival and wedding seasons. The main festival celebrated in the city is durga puja, which is followed by lakshmi puja, bhai phonta, deepawali etc. This festival season occurs during October to December. Apart from festival season, there are two major wedding seasons, during months of January-February and May. It was revealed that in a year, sweetshops get about 45 days of peak sales leading to very high consumption of chhana.
It was found that during peak demand periods of festival and wedding, consumption of *chhana* for sweet making increased almost three to four folds. The good business made during festival and wedding days helped sweetshops to hang on during rest of the periods with lower or moderate margins.

### 6.2.4 Costing of *Chhana* based Sweets

During study period, the unit price of *chhana* based sweets generally varied from Rs. 1 per piece to Rs. 10 per piece depending upon the size and quality. However, the *chhana* based sweets of price Rs. 2 and 3 accounted for major share of total sales volume.
The main difference between a Rs. 2 and Rs. 3 variety of rasogolla or sandesh was size of product, in other terms it was yield of sweet from 1 kg of chhana. Generally, rasogolla worth Rs. 220 to 260 is prepared from 1 kg of chhana, which is equivalent to 110 to 130 pieces of rasogolla of Rs. 2 variety or 73 to 87 pieces of rasogolla of Rs. 3 variety. In addition to chhana it requires 2.5 to 3 kg of sugar to convert 1 kg of chhana into rasogolla. Similarly, sandesh worth Rs. 150 to 180 is prepared from 1 kg of chhana, which is equivalent to 75 to 90 pieces of sandesh of Rs. 2 variety or 50 to 60 pieces of sandesh of Rs. 3 variety. In addition, it requires 250 to 350 gms of sugar to convert 1 kg of chhana into sandesh.

6.2.5 Distribution of Sweetshops by Source of Chhana used

The sweetshops of the city prepare and sell chhana based sweets using chhana from three main sources. While certain proportion of sweetshops uses either, only self prepared chhana or only purchased chhana, there are some sweetshops which use mix of self prepared and purchased chhana. During the study, attempt has been made to classify sample sweetshops on the basis of source of chhana used, in three groups, namely, only self prepared, only purchased and mix of self-prepared and purchased. The number of sample sweetshops under different groups is presented in table 28 and the percentage of sample sweetshops under different categories is presented in chart 24.

Table 28: Number of Sample Sweetshops under Different Categories of Source of Chhana Used

<table>
<thead>
<tr>
<th>Source of chhana</th>
<th>Number of sample shops</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only Self Prepared</td>
<td>247</td>
</tr>
<tr>
<td>Only Purchased</td>
<td>69</td>
</tr>
<tr>
<td>Mix of Self Prepared &amp; Purchased</td>
<td>134</td>
</tr>
<tr>
<td>Total</td>
<td>450</td>
</tr>
</tbody>
</table>

Source: Primary Data
The chart shows that majority of sample sweetshops of city, about 55 percent, manufactured *chhana* on their own. However, about 15 percent of the sample sweetshops of city totally depended on the *chhana* supplied by the *chhana* traders or *chhana* vendors. About 30 percent of the sweetshops of the city used self prepared *chhana* as well as purchased *chhana* required for sweet manufacturing. It was observed that there was a clear trend for using self prepared *chhana* mainly due to the quality consciousness. However, dependency on the purchased *chhana* continued primarily due to the non availability of sufficient milk, especially during the festival seasons.

### 6.2.5.1 Self Prepared Chhana vis-à-vis Purchased Chhana

During the study, efforts have been made to understand the rationale behind the use of self preparation of *chhana* vis-à-vis purchased *chhana* for manufacture of sweets by sweetshops of the city. Although about 55 percent of sweetshops entirely depended on self prepared *chhana*, about 45 percent of sweetshops depended solely or partially on purchased *chhana*. 

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**Chart 24**

Percentage of Sample Sweetshops under Different Categories of Source of Chhana Used

- Only Self Prepared
- Only Purchased
- Mix of Self Prepared & Purchased

Source: Primary Data
Majority of sweetshops used self prepared *chhana* primarily due to following reasons:

- The self prepared *chhana* is considered to be better in quality due to no adulteration and hygienic preparation.
- The self prepared *chhana* could be stored and used for a longer time for subsequent conversion to sweets. Thus, sweetshops preferred this because of higher shelf life.
- The sweets made with self prepared *chhana* yielded better quality sweets, which are more soft and fresh as compared to those made with purchased *chhana*.
- The sweets made with self prepared *chhana* could be maintained in good quality for much longer time as compared to sweets made with purchased *chhana*, which were spoilt earlier. As the shelf life of former was much longer, the shopkeepers considered this to be more profitable due to less spoilage.
- The self prepared *chhana* was found to have higher yield as compared to purchased *chhana*, i.e.; more quantity of sweets could be made out of *chhana* which is self prepared while lower quantity of sweets could be prepared using same amount of purchased *chhana*.
- In case of self prepared *chhana*, sweet makers had a better control on availability of *chhana*, especially during peak demand seasons when *chhana* was always in short supply.
- The sponge variety of *rasogolla*, which is a considered to be a premium variety, can be made only from fresh and hot *chhana*, which has to be self prepared.

However, about 30 percent of sweetshops have to partially depend on purchased *chhana*, especially during peak seasons to meet extra *chhana* requirement. The sweetshops, which depend on both purchased and self prepared *chhana*, generally used self prepared *chhana* for manufacture of premium sweets, viz., sponge *rasogolla*, soft variety of *sandesh* etc., and use purchased *chhana* for other *chhana* based sweets, viz., soft *rasogolla*, hard variety of *sandesh*, fried sweets etc.
Besides, there were about 15 percent of sweetshops which are solely reliant on the purchased chhana. These are mainly small sweetshops which usually make low-end sweet varieties. These sweetshops used purchased chhana for sweet manufacturing primarily due to the following reasons:

- The low scale of operation of these sweet shops did not support getting into chhana making and investing in additional facilities for the same.
- Most of these shops had a small area and therefore lacked adequate space required for manual in-house chhana making.
- The increasing fuel cost that is incurred for chhana making was another deterrent towards chhana preparation, especially in small scale.
- As chhana making is a labour intensive job, most of the small shops did not like to employ additional labour for this job in order to avoid the labour related problems.
- The non availability of adequate quantity of fresh cow milk locally, for preparation of chhana was another reason which discouraged sweet makers to make their own chhana.
- Most of these sweet shops wanted to ensure smooth supply of chhana irrespective of seasonal fluctuations in milk supply.
- The preparation of some variants like fried-chhana sweets, does not require a very high quality chhana and hence sweet shops, that are making mostly these kinds of sweets prefer to use purchased chhana.

6.3 Self-Preparation of Chhana by Sweetshops

As discussed earlier that around eighty five per cent of sweetshops of the city, either exclusively or partially, prepared chhana by their own for conversion into various sweets. So, efforts have been made in present study for understanding of in-house manufacturing of chhana.
6.3.1 Milk Used for Conversion into Chhana

Since long time, maintaining a cattle-shed within city premise is not permitted in Kolkata. So, for supply of milk to sweetshops of the city depends on various routes which provide milk produced away from city. It was observed that majority of milk was collected either directly from traders of wholesale milk markets or from milk vendors. For sourcing of milk, milk vendors depend on wholesale milk market. It was found in the study that only about 5 per cent of sweetshops, especially big sweet houses, maintained their own dairy farms in outskirts of city or collect milk directly from dairy farmers dwelling outside the city. The percentage of in-house chhana manufacturers under different categories of source of milk used is presented in chart 25.

![Chart 25: Percentage of In-house Chhana Manufacturers under Different Categories of Source of Milk Used](chart25.png)

Source: Primary Data

6.3.2 Wholesale Milk Market – Major Source of Milk for In-house Chhana Manufacturing

There are six major milk markets in Kolkata positioned in different locations of city, namely, Jorasanko, Chitpur, Hazra, Sealdah, Howrah-Pilkhana and Metiabruz. Jorasanko
milk market was largest among all milk markets of the city. Kar and Mandal (2001) extensively studied milk markets of the city. Trading of milk took place twice in a day, in morning and evening. Jorasankc market received both cow and buffalo milk from mainly four adjoining districts of North 24 Parganas, Nadia, South 24 Parganas and Hooghly. This market had about 300 milk traders, who formed an association named ‘Jorasanko Dudh Byabsayee Samiti’. Generally, traders enter into an annual contract with milk producers of adjoining districts for supply of milk at a fixed price. The price of milk was paid on basis of quantity of chhana obtained from one litre of milk. On an average, one liter of good quality buffalo milk yielded 230 to 250 g of chhana and one liter of good quality cow milk yielded 180 to 200 g of chhana. The selling price of milk was determined daily by voting by price fixing committee of samiti depending on demand supply equations. During study period, average price of cow milk was Rs. 16.50 per liter and that for buffalo milk was Rs. 22.50 per liter. Price range for cow milk varied from Rs. 11.50 to Rs. 28.00 per liter and that for buffalo milk varied from Rs. 17.00 to Rs. 40.00. Approximately, 6 lakh liters of milk was handled daily in this market. As per estimation of samiti, about 80-85 per cent of milk handled in this milk market got converted into chhana for sweet making.

Apart from Jorasanko milk market sweetshops of city also depend on other five milk markets of the city. Besides, milk is supplied to city directly from traders. In case of direct transaction between sweetshop owners and traders both types of price payment systems exist for liquid milk – floating price and fixed price. In fixed price system, there is a verbal contract between milk trader and sweetmeat shops that a fixed rate, irrespective of seasonal variation in price for chhana, would be paid throughout the year. In floating price system, price of milk received is highly volatile. The price is entirely determined by demand and supply mechanism in milk market. According to Pashchimbanga Mishtanna Byabsayee Samiti, market size of unorganized loose milk market including wholesale milk markets of Kolkata is of about 14 lakh liters of milk per day. Approximately, 60 per cent of this milk is utilized by sweetshops of the city for manufacture of various traditional dairy products; and out of this about 60 per cent is converted into chhana in sweet shops for chhana based sweet manufacturing.
6.3.3 In-house \textit{Chhana} Manufacturing Technology

It was observed that both systems of \textit{chhana} manufacturing, as observed in districts of Hooghly and North 24 Parganas, were prevalent in the city sweetshops. One method involved coagulation by mixing whey water with milk by parts continuously, the principle on which NDDB’s \textit{chhana} making machine has been designed. This method was prevalent in Hooghly district. The other method involved coagulation by mixing whey with milk one time batch wise. This method was also observed to be predominantly used by \textit{chhana} manufacturers of North 24 Parganas. The sweetshops of the city, which used self-prepared \textit{chhana}, were classified according to method of \textit{chhana} manufacturing employed by them in table 29.

\textbf{Table 29 : Classification of Sample Sweetshops as per Chhana Manufacturing Methods}

<table>
<thead>
<tr>
<th>Manufacturing Methods</th>
<th>Number of sample shops</th>
<th>Percentage of sample shops</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part by part</td>
<td>202</td>
<td>53.0</td>
</tr>
<tr>
<td>Batch wise</td>
<td>45</td>
<td>11.8</td>
</tr>
<tr>
<td>Both</td>
<td>134</td>
<td>35.2</td>
</tr>
<tr>
<td>Total</td>
<td>381</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Primary Data

It is evident from the table 29 that more than half of sample sweetmeat shops coagulate milk by the first method, colloquially called as “\textit{Dabbu Kata}”, and \textit{chhana} prepared in such fashion is called “\textit{jhim dana chhana}”. This type of \textit{chhana} is mainly used for manufacturing \textit{rasogolla}. Mostly cow milk, which is necessary for \textit{rasogolla} making, is coagulated in this fashion. \textit{Chhana} manufactured batch wise, colloquially known as “\textit{Charkha Kata}”, is used for mainly \textit{sandesh} making. The sweetmeat shops, more conscious about quality of sweets and catering to up market customers prepare \textit{chhana} using both methods separately for manufacturing different types of sweets.

The average yield of \textit{chhana} from one litre of cow milk was found to be around 164 g, i.e. about 6.1 litres of cow milk was required to produce 1 kilogram of \textit{chhana}. Whereas,
yield of chhana from one litre of buffalo milk was around 221 gm., i.e., about 4.5 litres of buffalo milk was required to produce 1 kilogram of chhana.

6.4 Purchase of Chhana by Sweetshops

In spite of an increasing trend for self preparation of chhana for sweet manufacturing, about 45 per cent of the city sweet shops still depended on the purchased chhana either solely or partially. The main reasons for this phenomenon were lack of sufficient infrastructure for chhana manufacturing and non availability of steady supply of milk. Sweet shops, which purchased chhana for conversion into sweets, were depended on three sources for supply of chhana, namely, chhana producers located in adjoining districts, vendors or foteders carrying chhana from chhana growth centers to Kolkata and traders or mahajans of wholesale chhana markets of the city. The percentage of chhana purchasing sweet shops under different categories of source of chhana during study period is presented in chart 26.

![Chart 26: Percentage of Chhana Purchasing Sweet Shops under Different Categories of Source of Chhana](chart.png)

Source: Primary Data
The chart shows that majority, about 85 per cent, of sample *chhana* purchasing sweet shops of the city, bought *chhana* from traders or *mahajans* of wholesale *chhana* markets of the city. Only 15 per cent of the *chhana* purchasing sweet shops were purchased *chhana* from *chhana* producers and vendors/foteders directly supplying *chhana* from adjoining districts.

Hence, efforts have been made to understand salient features of trade through wholesale *chhana* markets of the city. *Chhana* produced in growth centers, wrapped in muslin cloth and packed in bamboo baskets or metal buckets, is carried in slings and sold to vendors/foteders. The vendors/foteders normally make payment in cash against delivery of *chhana* and regular ledger entries are made for each transaction. As soon as *chhana* is produced, it is prone to microbial spoilage and shelf life decreases with time. In order to get a better price, it needs to be transported to wholesale *chhana* markets of Kolkata as early as possible. Local suburban trains are normally used to transport *chhana*, as this is cheapest conveyance system available. Each vendor carries about 40 to 60 kg of *chhana* and the transportation cost of *chhana* varies widely depending on distance and volume of *chhana*.

The vendors usually maintain permanent business relationship with traders of wholesale *chhana* market of Kolkata or with sweet shops of the city. Their long term relation helps them to hang on to business with low or moderate margins during most part of the year when prices in *chhana* market are not very lucrative. *Foteders*, who bear all risk of selling *chhana*, normally get 4 to 7 per cent commission in trade. The *mahajans* pay commission to vendors/foteders to ensure continued supply during period when demand for *chhana* shoots up in Kolkata market on account of marriages, festivals etc. and supply of *chhana* from village declines as disposing of milk in loose form becomes attractive in villages. The market fluctuates highly on day-to-day basis and is highly competitive especially due to ease of transportation and communication between *chhana* growth centers and Kolkata markets. The prices of *chhana* in wholesale markets of Kolkata is influenced by various factors such as climatic conditions at production centers, supply...
from hinterland areas, milk prices in wholesale milk markets, festivities, status of local trains running between city and districts, blockades/strikes etc.

6.4.1 Wholesale *Chhana* Markets of Kolkata

There are five wholesale *chhana* markets situated in different parts of Kolkata: Razakatra Market, Baubazar, Chhatubabur Bazar, Natunbazar, and Dumdum. The significant observations specific to each of the wholesale *chhana* market of the city are stated below.

- **Razakatra Market**: This wholesale *chhana* market is located in Barabazar area near Howrah bridge and in proximity to the Howrah station. This is the biggest *chhana* market in Kolkata. The *chhana* comes to this market mainly through Tarakeshwar-Howrah rail route from the *chhana* growth centers of Hooghly district, namely Tarakeshwar, Haripal, Dhaniakhali, and Arambag. The *chhana* is transported from Howrah station to this market by mutiaries hired by vendors/fotoders. These mutiaries are migrant workers from neighbouring states like Orissa and Bihar. They charge between Rs 50 to Rs 75 per trip from Howrah station to the Razakatra market on the other side of the Howrah Bridge (about Rs 1.00-1.50 per kg chhanna carried). The vendors/fotoders arrange to reach the *chhana* to the traders/mahajans in the wholesale market, with whom they maintain, long term business relationship and avail of loans and credits. There were 30 traders/mahajans operating in this wholesale market. The purchase rate of *chhana* in the wholesale market is governed by the prevailing demand and supply equation in the market and is decided by the price-rate committee who quote the rate of their preference for the day. During purchase, the *chhana* is tested by the traders for quality and adulteration by simple test methods like iodine tests and tasting. The *chhana* of this market is perceived to be of premium quality and the traders are quality conscious. The *chhana* trading usually starts around 11 am in the morning and continues till 5 pm in the evening. The average *chhana* handling in this market is about 6-7 MT daily. The
traders/mahajans, in turn, supply chhana to the sweet shops in the city and generally enter into annual supply contract with the shops on the basis of mutually agreed fixed rates. The traders/mahajans generally retain 6-10 per cent margin in the business.

- Chhatubabur Bazar – This is the second biggest wholesale chhana market in Kolkata. The chhana in this market comes mainly from Hooghly district and some parts of Bardhaman district. The chhana in this market also reaches Howrah station through local trains and carried to the market by mutiaries. The average chhana handling in this market is 3 MT daily. The mutiaries in this market charge slightly higher rates due to the longer distance of transportation between the railway station and wholesale chhana market. There were 15 traders/mahajans in this wholesale market, who supplied chhana to sweet shops in different parts of the city. The chhana traded in this market is also good quality, unadulterated chhana. However, chhana in this market commands less price premium as compared to chhana in Razakatra market.

- Baubazar – The chhana in this market is received mainly from North 24 parganas and Nadia district through Sealdah station via local trains. From the station, the chhana reaches the wholesale market through the mutiaries hired by the foteders. There were 8 traders/mahajans in this wholesale market. The average volume of chhana traded in this market is 2.5 MT daily. Along with the fresh chhana, predominantly traded in this market, a small quantity of creamless chhana is also received from some vendors of North 24 parganas district.

- Natunbazar – Chhana comes into this market from distant places by morning trains arriving at Howrah station. Quality of chhana in this market is generally inferior, which is mostly creamless and often adulterated with additives like arrarool, milk powder, maida etc. Hence this chhana is not preferred for manufacturing good quality sweets and normally used for culinary purposes and for preparing low
quality sweets after blending with fresh chhana. This type of chhana fetches lower price as compared to the chhana available in other wholesale market. There are 6 mahajans in this market and average chhana handling in this market is 1.5 MT per day. However, the demand fluctuation in this market is very high and goes up sharply during festival and marriage season. Traders enjoy slightly higher margin in this market.

- Dumdum: The chhana in this market comes via Dumdum Junction Railway station from chhana growth centers of North 24 Parganas, namely Swarupnagar, Baduria, Habra and Bongaon and of Nadia, namely, Shantipur and Krishnanagar. Chhana is transported from Dumdum station to this wholesale market through mutiaries hired by vendors/foteders. Due to proximity to market, price charged by mutiaries are considerably lower. There are only 5 mahajans in this market and average chhana handling in this wholesale market is 0.5-1.0 MT per day. Unlike other wholesale markets, trading timing in this market is much shorter and limited to 4-5 hours during evening.

6.4.2 Price of Purchased Chhana in Kolkata

Chhana prices in Kolkata market varies widely depending on demand-supply equations. The majority of sweetshops bought chhana either directly from wholesale chhana market or from chhana vendors. The sweetshops generally enter into annual supply contract with the mahajans/traders of wholesale market at a fixed rate. However, in case of direct supply by vendors, both types of chhana pricing, i.e., fixed and floating rates prevail.

The chhana prices in wholesale chhana markets in Kolkata, i.e., price paid to vendors/foteders by mahajans/traders, were varied within a wide range of Rupees 40.00 to 120.00 during study period. Vendors directly supplying to the sweetshops generally follow the prices of the wholesale market. In such cases, although commission of mahajan is not paid, premium is charged by vendors mainly for doorstep delivery.
During study period, average price paid by sweetshops in Kolkata was about Rupees 76.30 per kilogram of chhana.

Range of prices of chhana purchased by sweetshops during the study period is presented in table 30. Sweetshops having arrangement of fixed pricing system for supply of chhana paid in range of Rs. 62.00 to Rs. 87.00 per kg of chhana, whereas, sweetshops with floating pricing system paid in the wide range of Rs. 45.00 to Rs. 128.00 per kg of chhana. In case of floating pricing system, prices of chhana differed significantly between peak and off peak season. The same trend was also observed in case chhana producers’ price in both districts of Hooghly and Noth 24 Parganas.

**Table 30 : Range of Prices of Chhana Purchased by Sweetshops (in Rupees Per Kilogram)**

<table>
<thead>
<tr>
<th></th>
<th>Fixed Pricing System</th>
<th>Floating Pricing System</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Peak</td>
<td>Off Peak</td>
</tr>
<tr>
<td>Range of Price</td>
<td>Minimum</td>
<td>62.00</td>
<td>91.00</td>
</tr>
<tr>
<td></td>
<td>Maximum</td>
<td>87.00</td>
<td>128.00</td>
</tr>
</tbody>
</table>

Source : Primary Data (2006-09)

6.5 Estimation of Market Size of Chhana in Kolkata

Due to unorganized nature of chhana business in Kolkata, very little published information is available on market size of chhana in Kolkata. An effort has been made in this study to estimate market size of chhana in sweetshops of Kolkata from both supply side and from demand side.

6.5.1 Estimation of Market Size from Supply Side

It previous sections of this chapter, it was observed that there are two major components of chhana used by sweetshops for sweet manufacturing, namely Self prepared chhana
and Purchased chhana. For self preparation of chhana, there are mainly two sources of milk, wholesale milk markets of the city and milk directly supplied from nearby villages. Similarly, for purchase of chhana, there are mainly two sources of chhana were identified, wholesale chhana markets of the city and chhana directly supplied by chhana vendors or producers from adjoining chhana production centers. The quantum of chhana supplied by above four sources are estimated below.

A. Self Prepared Chhana:

1. Wholesale Milk Markets:
Wholesale milk market of city handle about 14 lakh liters of milk per day (LLPD), of which about 60 per cent is utilized by sweetshops for preparation of various traditional products like chhana based sweets, khoa based sweets, indigenous fermented products etc. Out of this sixty per cent, around 60 per cent is converted into chhana in sweet shops for chhana based sweet manufacturing.

So, total quantity of milk which is utilized for chhana preparation = (14 x 0.60 x 0.60) LLPD = 5.04 LLPD

Now, considering an average yield of 200 g of chhana from 1 liter of milk, total quantity of chhana manufactured from 5.04 LLPD of milk = (5.04 x 0.200 x 100) Metric Ton per Day = 100.8 MTPD

2. Direct Supply of Milk:
In chart 25, it was observed that only 5 per cent of total in-house chhana manufacturers depend on direct supply of milk from own dairy farms or from dairy farmers. This accounts for about (100.8 / 95 x 5) or 5.3 MTPD of chhana.

Therefore, the market size of self prepared chhana in Kolkata is about (100.8 + 5.3) or 106.1 MTPD.
B. Purchased Chhana:

1. Wholesale Chhana Markets:

There are five wholesale chhana markets in Kolkata and chhana supplied by each of these five chhana markets are as under:

<table>
<thead>
<tr>
<th>Market</th>
<th>Quantity of Chhana Handled in MTPD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Razakatra Market</td>
<td>6.5</td>
</tr>
<tr>
<td>Chhatubabur Bazar</td>
<td>3.0</td>
</tr>
<tr>
<td>Baubazar</td>
<td>2.5</td>
</tr>
<tr>
<td>Natunbazar</td>
<td>1.5</td>
</tr>
<tr>
<td>Dumdum</td>
<td>0.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>14.3</strong></td>
</tr>
</tbody>
</table>

So, wholesale chhana markets supply 14.3 MTPD of chhana to sweetshops of the city.

2. Direct Supply of Chhna:

In chart 26, it was observed that about 15 per cent of total sweetshops which purchase chhana depends on direct supply of chhana by vendors or chhana producers. This accounts for about \((14.3 / 85 \times 15)\) or 2.5 MTPD of chhana.

Therefore, market size of purchased chhana in Kolkata is around \((14.3 + 2.5)\) or 16.8 MTPD.

The total market size of chhana in Kolkata estimated from the supply side = \((100.8 + 5.3 + 14.3 + 2.5)\) MTPD = 122.9 MTPD ≈ 123 MTPD

6.5.2 Estimation of Market Size from Demand Side

Estimation of market size of chhana in Kolkata has also been attempted using primary data obtained from demand side. The percentage of sample sweetshops under different categories of average daily chhana usage as presented in chart 21 is extrapolated for
number of total sweetshops of the city, i.e., 15,000 and an estimation of total chhana consumption by sweetshops has been made.

<table>
<thead>
<tr>
<th>Average consumption of chhana (kg per day)</th>
<th>Percentage of sample sweetshops (%)</th>
<th>Number of total sweetshops</th>
<th>Total consumption of chhana (MTPD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5</td>
<td>56</td>
<td>8333</td>
<td>21</td>
</tr>
<tr>
<td>8.5</td>
<td>32</td>
<td>4867</td>
<td>41</td>
</tr>
<tr>
<td>18</td>
<td>6</td>
<td>833</td>
<td>15</td>
</tr>
<tr>
<td>38</td>
<td>3</td>
<td>500</td>
<td>19</td>
</tr>
<tr>
<td>75.5</td>
<td>2</td>
<td>300</td>
<td>23</td>
</tr>
<tr>
<td>150</td>
<td>1</td>
<td>167</td>
<td>25</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>15000</strong></td>
<td></td>
<td><strong>144</strong></td>
</tr>
</tbody>
</table>

So, total market size of chhana in Kolkata estimated from the demand side = 144 MTPD.

Taking into account of both estimations from supply side and demand side, it can be concluded that during study period market size of chhana in Kolkata ranges between 123 to 144 MTPD, which averages out to be about 134 MT per day.

Assuming a fixed market price of Rs. 80.00 per kg of chhana throughout the year, annual turnover of industry in Kolkata = Rs. (134 x 1000 x 80.00 x 365) = Rs. 391.3 crores per day. Kar and Mandal (2001) provided an estimated market size of chhana in Kolkata as 110 MTPD for year 2002. Considering their figure and our finding, it can be concluded that market of chhana in Kolkata is growing at a modest growth rate of around 4 per cent.

6.6 Problems of Sweetmeat Industry in Kolkata

Sweet-making is one of the oldest businesses in Calcutta, and also in West Bengal. Unfortunately, it is still entirely dependent on the age-old system of using manual labour.
The industry is dominated by small entrepreneurs with their small scale of operation, unhygienic manufacturing practices, energy-inefficient methods of production, inconsistent product quality, low shelf life of products, little or no packaging system. Despite the popularity of Bengali sweets among the NRIs all over the world, little effort has been made to thrust export of these products. Industry also perceives a threat to traditional sweets from new patenting laws and if its indigenous products are not registered, foreign companies may hijack the rosogolla or mishti doi.

Traditionally, the sweet manufacturers of city used to depend chiefly on purchased chhana for manufacture of various sweets. However, in recent years they are facing lots of problem with purchased chhana. In case of purchased chhana, major concern of industry is its declining quality. It was mentioned by sweetshop owners that the purchased chhana contains less quantity of fat, which results in poor quality of sweets. Even the yield and shelf life of sweets made from chhana are less as compared to those from self prepared chhana. These problems are compelling sweet industry to venture into self preparation of chhana. However, conversion of milk into chhana and then preparation of sweets from chhana at their own place has its inherent problems. Generally, sweetshops of city keep a small area nearer to their outlet for sweet preparation and storage. These sweet manufacturing workshops lack all glitz and glamour of outlets of sweets. These places are shabby, cramped and unhygienic for any food preparation. Photographs 24 and 25 showcased typical production and storage conditions of sweetmeats, respectively.

The manufacturing practices depicted in photographs 24 and 25 clearly indicate the reasons for lack of export of these tremendously popular products. Besides absence of proper technology, existing manufacturing practices like people without uniform, gloves and head masks, are way behind the stringent sanitary and hygienic standards required for global food trade.
Photograph 24: A Typical Sweetmeat Production Area

Photograph 25: A Typical Sweetmeat Storage Facility
Additional operation of chhana manufacturing puts extra burden on space and space is costly in urban city like Kolkata. Moreover, as chhana manufacturing operation is totally manual and time consuming, it requires extra manpower and time. Shortage of cheap labour is also an alarming problem for sweet manufacturers. Another major problem is sharp fluctuation of supply of both milk and chhana during peak and off-peak seasons. Due to all these problems, sweet industry of city is keen to have an uninterrupted supply of good quality chhana in reasonable price.

6.7 Status of Modernization in Sweetmeat Industry of Kolkata

Sweets are an indispensable part of the daily diet of most Calcuttans, but so far, little has been done to make their manufacturing process healthier. In Calcutta, sweets are manufactured almost entirely by hand. Consumers often complain of the poor hygiene standards in sweet-manufacturing units. It is surprising that despite the resources; science and technology have in no way influenced the conduct of this business till recently. But, sweetmeat industry in Kolkata is in a crossroad now. Unlike chhana manufacturing in district growth centers, sweetmeat industry is now taking steps to integrate traditional and modern methods of production.

The state's sweetmeat industry is undergoing a transformation to brace for competition from the confectionery and ice cream industries. The face lift is quite visible in display design and facilities of outlet of big branded multi-outlet sweetshops of the city. Air conditioned eating space, improved and hygienic cold storage facility, better packaging materials, clean well designed selling counter, digital weighing machines, computerized billing system are noticeable in many big sweet shops. K.C.Das has pioneered canning of rasogolla for selling into distant markets, which has been followed by few other branded sweets of the city. Few of the big sweet manufacturers like Hidusthan Sweets also certified for Quality Management Systems such as ISO 9001 etc.

However, with regard to manufacturing technology, efforts for modernization are only at its infancy. Fuel used for heating of milk and sweet bases are changing in a fast pace.
Traditional wood/coal/cowdung cake fired chullahs are getting replaced by kerosene/diesel fired stoves and gas fired ovens. Photograph of a diesel fired stove is presented in photograph 26.

**Photograph 26 : Diesel Fired Stove for Heating of Milk/Sweet Base**

Few of manufacturing equipments which are increasingly in use are chhana kneading machine and gas fired kettle with continuous agitator. Chhana kneading machine has replaced the manual kneading of chhana base for rasogolla and sandesh preparation. One machine costs about Rs. 8000/-. This equipment not only helped in increasing the speed and scale of operation but also helped in avoiding manual labour. The equipment is shown in photograph 27. Gas fired kettle with continuous agitator is originally devised for khoa preparation. However, this is also used for heating of milk for chhana manufacture and cooking of sandesh. This also helps in avoiding manual handling of chhana and in increasing the scale and speed of operation. This equipment is shown in photograph 28.
The new market reality has resulted in a change in character of Bengali sweets. Rapid changes are taking place in area of developing new variants of sweets. Sweet
manufacturers are working with dairy and food technology departments of various universities. Some innovative sweetmeat makers in the city have introduced "herbal sweets" that are being certified by food technologists as not only safe but also high in medicinal and food value. The enterprising sweet makers are adding some internationally preferred flavours like black current, kiwi and strawberry to desi sweets to cater to exotic palate. Shri Rabindra Kumar Paul, General Secretary of Pashchim Banga Mishtanno Byabsayee Samiti and Director of Hindustan Sweets indicated that besides people of Asian origin, Americans and Europeans are the potential customers. The new avatar of sweets will help in effectively marketing the products and convince overseas market of nutritional value of either a sandesh or a rasogolla compared to pastry, which is full of empty calories.

6.8 Summary

The chhana consumption pattern in Kolkata has revealed that sweetmeat industry of the city is dominated by the small entrepreneurs. About 88 per cent of sweetshops use less than 10 kg of chhana per day and about 86 per cent of sample sweetshops of the city have single outlets. Thus, channa based sweet business is dominated by small shop owners and hence it exists in unorganized sector. The individual owner manages sourcing of raw material and marketing of finished sweets as well.

Chhana based sweets available in the city shops have been broadly classified in three categories: Rasogolla, Sandesh and Fried Sweets. The characteristics of each of these categories of sweets and requirement of chhana for their preparation are vastly different. It was found that share of these three types of chaana sweets are almost in equal proportion. Seasonal fluctuation in demand of sweet does exist among people of Kolkata. It was found that in a year, sweetshops get about 45 days of peak sales leading to very high consumption of chhana. Majority of sweetmeat shops in Kolkata were found to use self prepared chhana for sweet manufacturing to ensure quality, although preparation of chhana is labour intensive and hazardous. However, at times the sweetmeat shops have to
depend on purchased *chhana* so as to ensure smooth supply of *chhana* during peak seasons when demand is very high. In general, sweetmeat shops are willing to switchover to readymade *chhana* from known and reliable source with guaranteed quality and reasonable price.

The consumption estimate from both supply side and demand side of sweet industry has been 134 metric tonnes of *chhana* per day by the sweet shops of Kolkata. The total turnover of the *chhana* industry in Kolkata is found to be around Rupees 391 Crores annually. It was also observed that the demand of *chhana* by the sweetmeat industry of the city is growing at a modest rate of about 4 per cent annually.

Unlike *chhana* manufacturing business in growth centers of Hooghly and North 24 Parganas, the sweetmeat industry of Kolkata has initiated efforts towards modernization. The traditional, family-based industry is now talking of export market and ISO 9000 systems — terms unheard of in the past. Big sweet houses are already putting efforts for mechanization of small unit operations to scale up operation and to reduce time of operation and man power.

After studying the various aspects of *chhana* consumption in the sweetmeat industry of Kolkata, in accordance with the objectives of the study, an analytical study for strategy formulation for modernization of *chhana* industry has been done in the next chapter.