CHAPTER I

INTRODUCTION

Fruits, vegetables, and their products have gained considerable importance as they contribute significantly to the human nutrition and economy of many countries in the world. Only in recent years, India, has focussed attention to the vast potential of its horticultural sector. Though, the progress registered in horticultural production during the recent past has been significant, the country has not yet reached the level of output comparable to many other countries, particularly in terms of production of quality processed products.

Preservation of fruits and vegetables being essentially, an extension of horticulture, both the sectors deserves simultaneous development. In the present context of development of Indian agricultural economy, processing industry has a very significant role to play.

The diverse agroclimatic conditions i.e. tropical, subtropical, temperate, semiarid and arid prevalent in India are conducive to the growth of a wide variety of fruits and vegetables. Horticultural crops in the country occupy about 7% of gross cropped area and contribute around 18-20% of the gross agricultural output. India stands second after Brazil in fruit production accounting for about 32.07 million tonnes and is the second largest producer of vegetables after China producing about 66.58 million tonnes (Kaul, 1993). In addition to the major fruits, a large number of minor fruits are grown and account for about 5.53 million tonnes of production. Many of these fruits like ber, pomegranate and aonla are known for their nutritional, therapeutic, medicinal properties and can be grown in the arid regions. The cultivation of ber in the states like Maharashtra, Haryana and Rajasthan has considerably increased in the recent years. Recently organizations like "International Centre for underutilized crops, UK have enviscised interest in developing the minor fruits and nuts of South East Asian Countries (Eiperson and Bhowmik, 1992).
Due to various factors like short harvesting season, inadequate infrastructural facilities for handling, storage and transportation coupled with adverse climatic conditions during major harvesting seasons, about 25 to 30% of the crop is estimated to be wasted. A conservative estimate of the economic loss due to this is of the order of Rs. 30 to 40 billions per year.

Fruits and vegetable processing though practiced in India since very long time predominantly for making pickles and preserves however, in the modern sense, the organised industry is still in infont stage. Started mainly to cater the requirement of the defence forces, the industry has registered a slow but steady growth, particularly during the last decade. The total installed capacity of fruit and vegetable processing industry which was only 2.75 lakh tonnes in 1980, has increased to about 8.94 lakh tonnes by the end of 1990. This works out to only about 1.5% of the total production of fruits and vegetables. As compared to this, the advanced countries like USA, Brazil, Australia and Israel process between 40 to 60% of their horticultural produce.

The range of products processed by the industry has remained narrow based, mainly depending on a few fruits and vegetables. Out of the total production of processed products, about 76% is based on fruits and mango being the most important raw materials accounts for about 60%. Among the fruit products, fruit juices, pulps, concentrates and beverages together account for more than 62%.

Even though, fruits and vegetables are considered to be one of the thrust areas in India’s export sector, in terms of actual export, the performance has been very unsatisfactory. During 1990, the export of fruit and vegetable products was only 48,900 tonnes valued at Rs. 736.7 millions which was less than the one in 1989 which were 63,967 tonnes valued at Rs. 794.8 millions. On an average, fruit juices, pulp and concentrates accounted for about 70% of the exports. Among processed vegetables, canned
and dehydrated vegetables together account for about Rs. 50 millions, and pickles and chutneys together about Rs. 65 millions. The Indian export market so far had been limited to a few countries, of which the erstwhile USSR was the largest, followed by middle East Countries, USA, UK and a few countries in Europe (Eiperson and Bhowmik, 1992).

At present the fruit and vegetable products have an export market of about 33% and the remaining being domestic market constituted mostly of institutional consumers like defence, airlines and hotels as well as household. Semifinished products like juices, pulps and concentrates constitutes the bulk of the exports. With the world trade in fruit and vegetable juices amounting to almost 5 billion dollar in 1990, the fruit juice industry has become one of the world’s major agrobusiness. The share of developing countries in the world trade in fruit and vegetable juices is reported to be 50% (Kejriwal, 1992). Factors like health consciousness, introduction of new flavours and blends, innovations to packaging etc. are expected to further push up the capita consumption.

In India, fruit and vegetable processing industry faces constraints such as higher cost of packing, transportation, taxation etc. which make the final produce expensive leading to a demand constraint within the local market. In terms of revenue of every rupee paid by the consumer, substantial amount go as direct/indirect taxes, cost of packing and transportation and the distribution cost. The studies on demand for processed fruit shows that the demand is very elastic. The reason is that at higher prices these produce become casual buys. Some of the short term solutions may be cheaper alternatives to packaging and to encourage processing of fruit and vegetable at home (Naik, 1981).

Fruits and vegetables which are called as protective food, are well known as valuable natural as well as cheaper source of essential nutrients such as minerals, proteins, vitamins, calories and fibres (Salunke, 1985). They play important role in human nutrition. Present production is able to supply about 120g of vegetables and 40 g of fruits
per day per capita as against the recommendations of the dieticians, i.e. 280 g of vegetables and 120 g of fruits (Kaul, 1993) revealing a big gap.

As mentioned earlier the fruits and vegetables losses are very heavy due to inadequate facilities of their post harvest handling and processing. The fruit and vegetables processing industry, at commercial as well as at small scale, can salvage some of these losses by siphoning the surpluses and utilization of culls. Besides, fruit processing industry may help in stabilizing the prices and marketing as it will make such fruits and vegetables available during off season.

Apart from seasonal fresh fruits, there are numerous canned fruits too that you can use out of season and thus save a lot of time.

At present processing industries utilize hardly 0.3% of total fruits and vegetables production (Anon 1985). For commercial utilisation of fruits, water is very essential. However there is another field to be exploited to tide over the problems of inadequate nutrition supply i.e. increasing an availability of fruits mostly wild types which are not so far commercially exploited for the cultivation. In forest or elsewhere, these fruits grow naturally and are adopted to naturally available moisture conditions. This becomes the separate group of fruits called "dryland fruit crops". Among them, important are mango, ber anonas (Sitaphal), aonla, jack fruit (Phanas), jamun, bell fruit, wood apple (Kawath) etc. They are good source of nutrients, minerals and vitamins (Anon, 1963 and 1980) and are easily available in local rural markets or in tribal areas. The increased awareness about nutrition and health in the society probably is reasonable for increase in consumption of fruits and vegetables and also fruit growers are diverted towards cultivation of dryland wild fruits, which gives comparatively good economic returns. The improvement work has began to standardize their cultivation practices, breeding high yielding varieties and also standardize their cultivation practices as well as pre and post harvest practices including
storage, processing etc.

Though ber is an indigenous and grown practically all over the country, it is commercially cultivated in Northern India over an area of about 24,257 acres (Anon, 1963). There is also a record of some improved varieties selected locally for growing in these areas (Chopra and Shrivastava, 1973). Ber is found widely grown in the plains and forest areas of Maharashtra with sporadic evidence of its commercial cultivation. It is cultivated in districts of Maharashtra particularly in dry arid areas like Solapur, Ahmednagar, Puna, Jalgaon, Usmanabad and Latur to some extent. In Vidarbha this crop is also becoming popular and thousands of wild ber trees exists on bunds, low lying areas of nalas, riverbanks etc. and these are converted into improved ones during last three-four years (Anon, 1988). Abilities to thrive in lighter soils with minimum care and assured yield of this crop have been responsible for increased cultivation in these dry areas of the state. This is one of the richest sources of vitamin C and also contain vitamin A and B (Anon, 1963). It is often called as "the poor man's fruit". The hawkers are seen selling fresh fruits during season and dried fruits powder (Borkut) and fruit in syrup infront of schools in urban areas. The fruits of the improved varieties give an excellent candy (Lai, et al., 1986). Reports are available that there is no much difference in the nutritive quality of the processed products as against the fresh one (Steven, et al., 1977). Nutritive quality of the product varies with commodity and its kind (Anon, 1979). However, the period of storage and temperature of storage may affect the nutritive quality of the stored products (Hulme, 1971). At present, fruits are marketed as such and it has become necessary to develop processed products prepared from ber on common scale. However, the ber may be used for canning and preparing preserves, beverages and candy (Lal, et al., 1960), drying and dehydration (Khurdia, 1986).

The processed products made from such cheaply, wildly and plentiful available
fruit which is a fruit of common man of rural India, we help indirectly to increase its production by salvaging its spoilage and by increasing its availability during off season.

Though some attempts have been made by community canning centres and other organizations in the country to train the housewives in processing of common fruits and vegetables available at consumption areas on home scale. Ber fruit has not received any attention so far. Therefore, following outline with specific objectives have been proposed to carry out research studies on home scale preparations of ber products with reference to standardization of their preparations and their evaluation in terms of nutritive value, palatability, storage and economics.

**Aims and Objectives**

1. To identify the different products to be prepared from ber and standardize the process for preparation of such products.
2. To study the suitability of different ber cultivars for various products.
3. To determine the nutritive value of fresh as well as processed ber products.
4. To study the shelf life of ber products.
5. To study the periodical losses in nutritive values of various products during storage.
6. To study the drying rate of the various ber cultivar in sundrying and mechanical drying.
7. To study the consumer’s acceptability of various ber products, by computing the consumer index.
8. To study the economics of home scale products prepared from ber.