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An Overview of Processed Fruits Export from India: Growth, Status and Trend

B. Keerthika[1*], M. Thilagavathi[1], C. Indu Rani[2], M. Prahadeeswaran[1] and R. Vasanthi[3]

[1]Dept. of Agricultural Economics, CARDS, TNAU, Coimbatore (641 003), India
[2]Dept. of Vegetable Science, TNAU, Coimbatore (641 003), India
[3]Dept. of Social Sciences, HC&RI, Periyakulam (625 601), India

Corresponding Author

B. Keerthika
e-mail: keerthikakural@gmail.com

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Abstract

The current study was conducted during 2022–23 and the data was collected for twenty years from 2001–02 to 2020–21 from different sources. India is the leading producer of Fruits as well as vegetables after China, producing about 99.07 million mt of fruits and 191.77 million mt of vegetables. Even though we are the largest producer,the wastage of horticultural commodities is very large due to improper post-harvest management and lack of awareness about storage.The commodity specific processing, preservation and value-addition should be used to reduce the wastage which will also increase the income of the farmers by exporting them to different countries. This study is proposed to analyse the commodity specific export in the processed fruits exports from India. The major products of processed fruits exports identified are jam, jelly and marmalades, mango pulp, dried fruits, juices, squash and preserved berries. The Compound annual growth rates were calculated and it was found that jam, jelly and marmalades had higher growth rate of 17% in terms of volume of export and dried fruits exports showed higher growth rate in terms of value with CAGR of 10.31%. Hence, scientific methods of value-addition and packaging facilities should be developed in the country to compete with the global processing industries which will increase the export to many countries.

Keywords: CAGR, commodity-specific, growth rate, infrastructure, post-harvest

1. Introduction

Globally the fruits and vegetable production accounts for 22% of the totalagricultural production (Grünwald, 2021). 1099 mt of vegetables and 843 mt of fruits were produced annually in the world whereas 80% of the production comes from Asia itself (Anonymous, 2019). India is the world's second-largest producer of fruits and vegetables, trailing after China. According to the National Horticulture Database (Second Advance Estimates) published by the National Horticulture Board, India produced 99.07 million metric tonnes of fruits and 191.77 million metric tonnes of vegetables from 2019 to 2020. Fruit cultivation covered 6.66 mha, while vegetable cultivation covered 10.35 mha. According to FAO (2019) and Singh et al. (2021), India is the world's largest ginger and okra producer and ranks second in the production of potatoes, onions, cauliflowers, brinjal, cabbages, and other vegetables. Among fruits, the country ranks first in banana production (26.08%), papaya production (44.05%), and mango production (including mangosteens and guavas) (45.89%). The food and grocery market in India is the sixth-largest in the world (Singh, 2019). The food processing industry contributes 32% to this food market and is also one of the largest industries in the country (Sarangi and Icsi-Ccgrt, 2017; Joseph and Mammen, 2020), contributing 13% to total export and 6% to industrial investment (Padmavathi, 2019). The vast production base provides India with numerous export opportunities and during 2020-21, India exported fruits and vegetables worth of ₹ 9,940.95 crores/ 1,342.14 USD Millions, of which ₹ 4,971.22 crores/674.53 USD Millions were fruits and ₹ 4,969.73 crores/ 667.61 USD Millions were vegetables (Anonymous, 2021; Sah et al., 2022; Kumari and Suseela, 2022). Federation of Indian Export Organisation explained that many countries have imposed stringent quality norms, which make it difficult for exporters of fresh fruits and vegetables (Jongwanich, 2009; Jahan, 2023). And also, fruit and vegetable loss percentages are relatively high around the world due to factors such as labour demand and perishability (Madrid, 2011; Chrisendo et al., 2023 and Zhu et al., 2023). Sub-Saharan Africa suffers

the greatest losses,) ranging from 15 to 50% ((Food, 2016). Losses are lower in East and South-eastern Asia (up to 13%) and even lower in Central and South Asia with a maximum of 7% (Kaminski and Christiaensen, 2014). Hence, shipping fresh fruits and vegetables are gradually becoming challenging but exporting their processed variants is easier. The primary drivers of the industry for fruit and vegetable processing are a rise in consumer concerns about the safety of food products and demand for processed quality food items (Kearney, 2010). Processed foods are those that have been altered in some way during their preparation before being consumed (Rais et al., 2013; Vitale and Schillaci, 2015 and Ramli et al., 2022). The primary drivers of the industry for fruit and vegetable processing are a rise in consumer concerns about the safety of food products and demand for processed quality food items. The global fruit and vegetable processing market was valued at USD 8.37 billion in 2021, with a CAGR of 6.5% expected during the forecast periodof 2030 (Polaris Market report, 2022). India's exports of Processed Food were ₹ 36,946.20 Crores in 2020–21, including the share of products like Mango Pulp (₹ 714.41 Crores), Processed Vegetables (₹ 3718.65 Crores), Cucumber and Gherkins (Prepd. and Preserved) (₹ 1651.83 Crores), Processed Fruits, Juices and Nuts (₹ 3173.42 Crores). India is the major producer of processed vegetables like preserved onions, cucumber and gherkins, mushrooms of the genus *agaricus*, other mushrooms and truffles, green pepper in brine, dried truffles, asparagus dried, dehydrated garlic powder, dehydrated garlic flakes, garlic dried, potatoes dried, grams, grams dal, onion prepared/preserved, etc. Many non-traditional vegetables mainly processed cucumber and gherkins and other vegetables like asparagus, celery, bell pepper, sweet corn, green and lime beans, and organically grown vegetables are also being increasingly exported (Jha and Sikdar, 2014). Hence, this study has been proposed with an objective of analysing the product level trend in the export status of processed fruits and processed vegetables from India.

2. Materials and Methods

2.1. Data source

The current study was conductedduring 2023 and time series data was collected from 2001–02 to 2020–21. The major source of data was collected from APEDA whereas other sources were also used such as Directorate General of Commercial Intelligence and Statistics (DGCIS), Ministry of Food Processing Industries (MoFPI) and other official government websites. The export data of processed fruits and processed vegetables was collected for 20 years from 2001–02 to 2020–21 and the data was classified according to the product for processed fruits where it was not classified according to the HS code. Firstly, the data was collected from different sources. Then it was tabulated and categorized depending on the fruit's products such as Mango Pulp, Jam, Jelly and Marmalades, Dried fruits, Squash, Juices, Preserved Fruits, Processed Berry and Other Processed fruits. Finally, simple %age, average and trendline was used to find the trend of export of these products.

2.2. Tools of analysis

Compound Growth Rate: Any variable's growth reveals its past performance and is widely used in economic research to determine a variable's trend over time. CGR was calculated to identify the trend in the production and export of processed fruits from India. The formula used in this study was similar as described by Angles et al., 2011 in his study

$Y_t = ab^t u_t$

The prescribed model then transformed into logarithmic form as given below and used for the estimation of co-efficient of selected variables in this study.

$\ln Y_t = \ln a + t \ln b + \ln u_t$

The regression analysis was carried out using OLS method to work out the estimates. Then the worked-out estimate (b) value with respect to each variable used to calculate the compound annual growth rate (CAGR) using formula as described below

CAGR (r)=[Antilog (log b)-1]×100

where,

r=Compound Growth Rate in per cent

The t statistics was used to determine the standard error of growth rate and assess its significance.

3. Results and Discussion

3.1. General trend in the export of processed fruits from India

India's exports of Processed Food were ₹ 36,946.20 Crores in 2020–21, including the share of products like Mango Pulp (₹ 714.41 Crores), Processed Vegetables (₹ 3718.65 Crores), Cucumber and Gherkins (Prepd. and Preserved) (₹ 1651.83 Crores), Processed Fruits, Juices and Nuts (₹ 3173.42 Crores). The processed food market in India is expected to grow to ₹ 3,451,352.5 crores (US$ 470 billion) by 2025, from ₹ 1,931,288.7 crores (US$ 263 billion) in FY20 (IBEF, 2022). Fruits and vegetables exports were increasedby 12% to touch $ 1676 mn in 2021–22 against $ 1492 mn in 2020–21, while processed fruits and vegetable exports were increased by 7% to reach $ 1202 mn in 2021–22 against $ 1120 mn in the previous year. The overall FDI for the food processing sector shows an increase in the investment over years from US$ 45.57 Million in 2000–01 to US$ 393.41 Million in 2020–21 which was peaked during 2017-18 with US$ 904.90 Million.

The overall export of processed fruits from India is presented in Figure 1. It is observed from the figure that the export of processed fruits increased from109859 MT in 2001–02 to 347793 MT in 2020–21 with the overall highest export of 403615 MT in 2013–14 where the value of export also increased during the study period from USD 76 million in

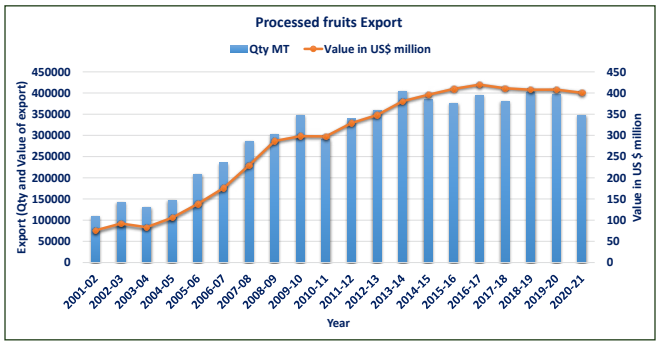

Figure 1: Export of Processed fruits from India; Source: APEDA, Export Statistics

2001–02 to USD 400 million in 2020–21. The average of quantity of processed fruits exported for two decades viz., 2001–02 to 2010–11 and 2011–12 to 2020–21 was analysed and the graph (Figure 2) showed that the export during the second decade was higher with average of 378286.69 mt of exports compared to 219741.89 mt in the first decade and the reason was due to infrastructure development in the processing sectors by various schemes like Pradhan Mantri Kisan Sampada Yojana (PMKSY), PM Formalisation of Micro Food Enterprises (PM-FMFE) etc.

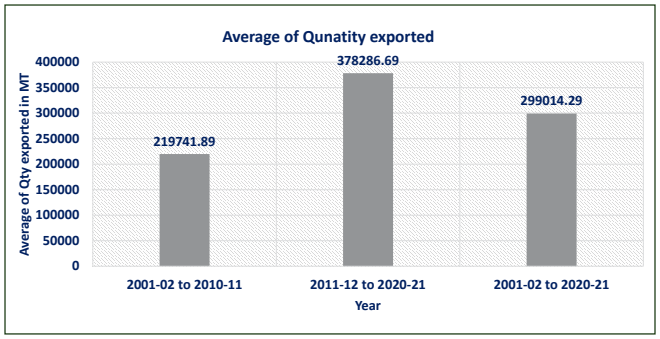

Figure 2: Comparison of decadal average of quantity exported-Processed Fruits; Source: Authors own calculation from export data collected from APEDA

3.2. Selection of major processed fruits export

Form the data, it was observed that the export of Jam, jelly and Marmalades was maximum with 1,22,862.92 mt which was 35% of the total processed fruit export followed bymango pulp (28%), dried fruits (17%), squash (9%), other processed fruits (7%), juices (1%), processed berries (0.41%) and preserved fruits (0.25%) during 2020-21. But looking into the year 2016-17, mango pulp constituted the highest export (1,30,886.07 MT) share of 33.24% of the total processed fruits.. The reason behind the shift in the export from mango pulp to jam, jelly and marmalades was the lower production of the Totapuri variety of mango which is considered to be the most suitable variety for pulp extraction.

Even though the export shifted to jam, jelly and marmalades, the 82% export within this group constitute of jam, jelly and marmalades of mango followed by jam, jelly and marmalades of guava (9%), jam, jelly and marmalades of other fruits (7.9%) and the remaining 2% constituted by jam, jelly marmalades of pineapple, citrus, apple and other homogenized fruit preparation. Within the dried fruits category, raisins and tamarind dominates the exports with 40% and 36% respectively of the total dried fruits exported followed by other dried fruits (14%), dried mango (5%) and prunes (4%), whereas dried apples, apricots and mixed dried fruits combinedly constitute the remaining 1% (Figure 3).

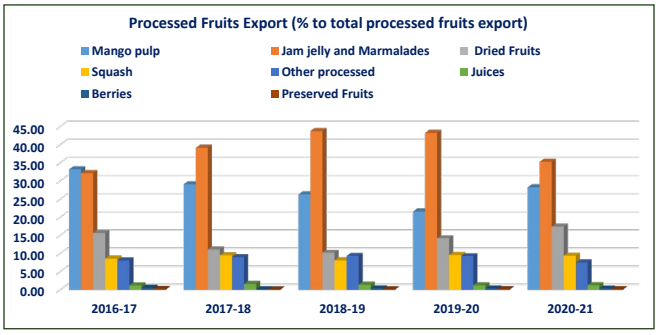

Figure 3: Major processed fruits export from india

3.3. Compound annual growth rate forthe export of selected processed fruits

The Compound annual growth rate (CAGR) was calculated using the formula and the results are given in Table 1. From the table it is observed that the CAGR of jam, jelly and marmalades are higher in terms of quantity with 17.61% growth whereas dried fruits had higher growth rate in terms of volume with a CAGR of 19.94%. The growth rate in the export of mango pulp was 10.96% in terms of volume exported and 2.57% in terms of value of export

Table 1: CAGR of major processed fruits from India (2001–2021)

Particulars	Jam, jelly and marmalades		Mango pulp		Dried fruits	
	CAGR	t-value	CAGR	t-value	CAGR	t-value
Quantity (MT)	17.61	13.39	10.96	0.26	11.22	8.19
Value (US$)	18.96	12.06	2.57	1.96	19.94	10.31

4. Conclusion

The research reveals India's shift from exporting fresh fruits to high-value processed items. Growing demand from global markets, multinational restaurants, and changing youth consumption patterns drive the industry to increase production. Selected commodities exhibit positive and significant export growth rates. Encouraging processing among entrepreneurs, promoting destination-specific packaging, and raising awareness about labelling can prevent border

rejections. There's also a need to target domestic demand from fast-food retail outlets for sustained growth.

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