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Fruit and Vegetable Beverages

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Abstract

India, due to its diversified climatic condition and soil, is able to produce a variety of tropical, sub-tropical and temperate fruits along with vegetables. India has witnessed increase in horticulture production over the last few years. Significant progress has been made in area expansion resulting in higher production. Over the last decade, the area under horticulture grew by 2.6% per annum and annual production increased by 4.8%. During 2017-18, the production of horticulture crops was 311.71 Million Tonnes from an area of 25.43 Million Hectares. The production of vegetables has increased from 101.2 Million Tonnes to 184.40 Million Tonnes since 2004-05 to 2017-18 and production of fruits has increased from 50.9 Million Tonnes to 97.35 Million Tonnes since 2004-05 to 2017-18.

Keywords: Fruit, beverages, and juice

Introduction

- India is the second largest producer of the Fruits and Vegetables in the world with a production of 311 million Tonnes. India is the world's largest producer of bananas, papaya, mangoes and guavas, second largest producer of potatoes, green peas, tomatoes, cabbage and cauliflower. India witnesses nearly 4.6-15.9% wastage in fruits and vegetables annually, due to lack of modern harvesting
- Practices and inadequate cold chain infrastructure.
- Processing levels in F&V currently stand at close to 2%. Fruits and vegetables are mainly processed into Frozen, pulp, puree, paste, sauces, snacks, dressings, flakes, dices, dehydration, pickles, juices, slices, chips, jams, jelly, RTS drinks and canning. India's exports of Processed Fruits and Vegetables were around USD 1.1 Bn in 2016-17, which majorly included Dried and Preserved Vegetables and Mango Pulp (Opportunities in fruits & vegetables Sector in India, Ministry of Food Processing Industries Government of India).

Fruit and vegetable processing

It is known that fruits are rich sources of many bioactive compounds such as ascorbic acid, carotenoids, anthocyanins, polyphenols, fibres, vitamins and minerals. These bioactive compounds have exhibited many health promoting actions. Among various processed products from fruits and vegetables, beverages are the one which are more preferred by consumers due to its convenience, variety and health benefits. It has been reported that consumers prefer mixed fruit beverages and there is an increasing growth in its consumption globally. The fruit juice market is one of the most innovative product markets and one of the most competitive segments in the beverage industry. Fruit juices form part of what are termed as 'new age beverages'.

Market outlook

Currently, there are about 75% of unorganized players are in juice fruit production. And about only 25% of established brands are involved in juice, fruit bars and packaged juice manufacturing industry. Among the different fruits, mango has the biggest share in fruit juice industry which constitutes to 60% of total fruit juice production.

Global fruit juice market trends

- The consumption of soft drinks, such as colas and flavoured sodas, is reducing globally as they have high sugar content, artificial colouring, phosphoric acid, artificial sweeteners, and caffeine which can cause negative effects on the human body. Owing to this, a large number of consumers are shifting from carbonated drinks towards natural fruit juices.

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2. Changing lifestyles and altering eating patterns of the consumers have resulted in an increased intake of affordable, healthy and quick sources of nutrition like packaged fruit juices, thereby catalysing the growth of the market.
3. In order to expand the consumer-base, manufacturers are introducing a wide array of flavours, and producing preservative-free and sugar-free fruit juices. In addition to this, growth in the food and beverage industry is boosting the overall demand for fruit juices worldwide.
4. Earlier, a number of players were hesitant to sell their products in the emerging countries due to the lack of infrastructure and storage facilities. Nonetheless, with a rise in the number of organized retail outlets, several players are now willing to invest in these markets which are expected to bolster the growth of the fruit juice industry (imarkgroup.com). On the basis of type, the global fruit juice market is segregated as 100% fruit juice, nectars, juice drinks, concentrates, powdered juice and others. Currently, juice drinks account for the majority of the market share, representing the most popular product type. Juice drinks contain several vitamins, flavors and anti-oxidants owing to which they are preferred by the consumers.
5. Based on flavors, the market is classified as orange, apple, mango, mixed fruit and others. Amongst these, orange fruit juice holds the majority of the market share as it is rich in vitamin A, vitamin C, calcium and iron.
6. On the basis of distribution channels, supermarkets and hypermarkets represent the largest segment as they offer easy access to a wide variety of fruit juices depending on different brands, types and flavors. Supermarkets and hypermarkets are followed by convenience stores, specialty food stores, online retail and others.

Technological overview

According to the US Code of Federal Regulations, “juices directly expressed from a fruit or vegetable (i.e., not concentrated and reconstituted) shall be considered to be 100% juice and shall be declared as ‘100% juice.’ Fruit juice obtained from fresh fruits may have lesser amount of vitamin C, calcium and dietary fibre which otherwise shall be obtained by consuming fresh fruit.

As per the FSSAI (Food Safety and Standard Authority of India), Thermally Processed Fruits Juices (Canned, Bottled, Flexible and/or Aseptically Packed) means unfermented but fermentable product, pulpy, turbid or clear, intended for direct consumption obtained by a mechanical process from sound, ripe fruit or the fresh thereof and processed by heat, in an appropriate manner, before or after being sealed in a container, so as to prevent spoilage. The juice may have been concentrated and later reconstituted with water suitable for the purpose of maintaining the essential composition and quality factors of the juice. It may contain salt.

Thermally Processed Vegetable Juices (Canned, Bottled, Flexible Pack and/or Aseptically Packed) means the unfermented but fermentable product or may be lactic acid fermented product intended for direct consumption obtained from the edible part of one or more vegetables, including roots, and tubers (e.g. carrots, garlic) stems & shoots (e.g. Asparagus), leaves & flowers (e.g. spinach and cauliflower) and legumes (e.g. peas) singly or in combination, may be clear, turbid or pulpy, may have been concentrated &

reconstituted with water suitable for the purpose of maintaining the essential composition & quality factors of the juice and processed by heat, in an appropriate manner, before or after being sealed in a container, so as to prevent spoilage. It may contain salt, nutritive sweeteners, spices and condiments, vinegar, whey or lactose rum having undergone lactic acid fermentation not more than 100 gm/kg and any other ingredients suitable to the product.

Some of the terminologies that are being used in the fruit juice industry are given below for better understanding. Pulp /

Puree

Pulp or puree is the pure fruit content extracted from the fruit (mostly ripe).

Pulping is done either using an industrial pulper (that comes in various capacities) or a mixer/mixie (the one used domestically in kitchen). Pulp extraction is done in case of pulpy fruits like mango, banana, guava, papaya, etc.

Pure juice

Juice is the one which is expressed from a ripe fruit normally by pressing / squeezing or using a juicer (as in case of oranges). This is used in non-pulpy fruits like grapes, oranges, lime/lemon, etc.

Clarified juice

Clarified juices are also pure juices from which the pulpy material / insoluble solids are removed using enzymes like Pectinases or enzyme cocktails depending on type of fruits. Clarified juices are generally clear and sparkling / transparent. Both pulpy and non-pulpy juices can be clarified if necessary.

Concentrate

It is the concentrated pulp or juice. The concentration is achieved by removing water from the pulp or juice by different means / methods / machineries. For example, mango concentrate comes in 28°Brix format (which is almost 2-times the natural brix content of mango pulp/puree).

TSS (Total soluble solids)

The TSS is measured using an instrument called ‘Refractometer’ and the value is expressed in degree (°) Brix. This mainly constitutes sugars, acids, water soluble vitamins like C, B-complex, soluble proteins and soluble starch present in the fruit. The TSS level indicates how sweet the fruit or its juice is.

Acidity

Acidity indicates how much sour is the juice/pulp. All fruits have natural acids in them. They could be organic acids like citric, malic, tartaric or more than one of them in different proportions depending on the fruits.

Food Safety and standard authority of India

- FSSAI is an autonomous body established under the Ministry of Health & Family Welfare, GOI
- Established under Food Safety and Standards Act, 2006
- These regulations came into force on 5th August, 2011
- Responsible for protecting and promoting public health through the regulation and supervision of food safety
- The Act covers activities throughout the food distribution chain, from primary production through distribution to retail and catering.

- Licensing and registration of food business.
- Procedure for registration of food business.
- Filing of an Application.
- Processing of Application.
- Either grant or reject Registration Certificate.
- Issue notice for inspection.
- After the Inspection grant the registration.

Beverage technologies available at ICAR-IIHR RTS	Squash
Banana	Banana
Amla	Amla
Mango	Mango
Jackfruit	
pomegranate	Amla with Bottle gourd
Guava	guava
kokum	Kokum
Watermelon	
Blended Grape	Grape
Pineapple	Pineapple
Passion fruit	Passion fruit
Bitter gourd	

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