



## GENERAL ARTICLE

# Postharvest processing of green banana

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## ABSTRACT

India being a largest producer and consumer of banana in the world and its area and production has been increasing at a fast pace, the post-harvest losses of this highly nutritious fruits are quite serious in our country. Generally wastage of this fruit before it reaches the consumer is due to lack of proper processing and storage facilities. Therefore in order to overcome these losses, one effective method would be by converting it into various commercial banana products. India is the largest producer and consumer of banana and it shares about 33.4 per cent of the total fruit production of country. Green banana cannot be eaten as raw, hence further processing is required. Green banana peel contains many medicinal properties and health benefits. About 2.5 per cent of production of banana is processed different types of value added products such as fried chips, dehydrated chips, pulp, powder and green banana peel soups, peel chutney etc. These products are gaining wide popularity in our day-to-day life due to change in life style. The development of value added products in production catchment area will improve the market effectiveness and add extra income to the farmers which will help in enhancing their economic conditions and generate employment for rural youth.

**Keywords:** Green banana, Value addition, banana peel, Health benefits

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## INTRODUCTION

Banana (*Musa paradisiaca*) is a tropical plant and is cultivated in more than 130 countries. India produced about 29 million MT of banana in 8.60 lakh hectares area with productivity of 33.9 MT/ha in 2016-2017. But, banana production in India is more for domestic consumption. More than 70 per cent of the total banana are produced in Maharashtra, Kerala, Tamil Nadu, Gujarat, Bihar, West Bengal, Assam, Andhra Pradesh and Karnataka states.

Green bananas cannot be eaten raw. They are peeled, sliced and then either dehydrated, cooked, boiled or fried before consumption (Dhake et al., 2019). In addition to their food applications, green defoliating bananas have anti-microbial properties and have been used as medicine as they have high content of antioxidants (Rodriguez- Ambriz et al., 2008). There are different varieties of banana such as Dwarf Cavendish, Basrai, Robusta, Red Velchi, White Velachi, Rajeli, Neandran, Grand Nine, Shremanti, Red Banana.

The shelf life of banana is short, and spoilage is almost sure if not handled properly, and therefore waste is abundant. The average harvest and post-harvest losses of banana is found to be 6.6 per cent (Nanda et al., 2012) and 7.76 per cent (Jha et al., 2015) due to lack of proper handling and transportation facilities, mechanical injury, injuries due to thermal shock, disease

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and insect attack, microbial attack and physio-biochemical causes etc.

### HARVESTING AND HANDLING

The banana bunch takes approximately 85–150 days from emergence to full maturity, depending on the varieties, climatic conditions and variation in diversity of soil, weather conditions and elevation. Each bunch may contain 100–400 fruits. A number of external and internal characteristics such as of fruits, age of the bunch, angularity of the fruit, length of the fruit, and peel color of banana can be used to determine its maturity. The stage of maturity of banana also depends on the intended market destination (Johnson, *et. al.*, 1998). Harvesting is mainly done with the help of sickle or sharp knife. Harvested bananas are then transported.

### GREEN BANANA PROCESSING

Nowadays processed products are gaining popularity in our day to day life. Ninety percent of the banana is consumed as a fresh fruit and merely 5 per cent is processed showing good potential for future value addition. About 2.5 percent of produce is processed as various value added products and the rest is consumed as an ingredient in foods. There are more than 15 different types of value added products are prepared from bananas. The main product is fried chips and others are banana pulp, wafers, powder etc. (Rashi and Jyothsna, 2011, Dhake et al., 2019).

Various functional and nutritional products can be developed using bananas and its parts. The value added products from banana are a boon to small and marginal level enterprises.

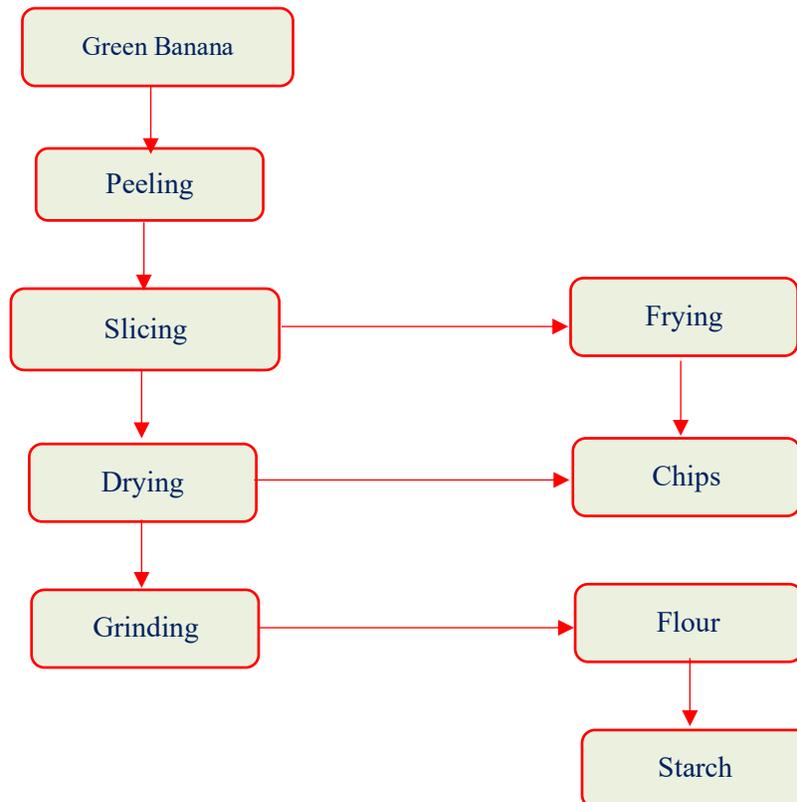


Fig. 1 Diagrammatic representation of various processed derived from green banana (Mohapatra, et al., 2010)

Banana peel: Many health benefits are associated with of banana peel such as protection of cardio vascular system, protection of red blood cells, eye health, aid in weight loss and obesity, anticancer appearance agents, skin health etc. Banana peels contain 40 per cent of the total weight of fresh bananas and mostly discarded as waste. Banana peel flour has a good potential for use in fortification of many value added products. The main hindrance is to peel the green banana. Banana peel flour can be supplemented and mixed or replaced by many products in preparation of noodles.

Dehydrated banana chips: The CFTRI, Mysore has developed process technology for banana chips from Cavendish and Neandran cultivars of banana. The chips are produced from dehydrated banana slices after peeling. The enzymes (phenolysis) responsible for browning is inactivated by heat treatment through blanching. Banana chips can be osmotically dehydrated in a saline solution and then dried in a conventional air-dryer, microwave, radio frequency, infrared, vacuum or freeze-dryer to reduce drying time and cost (Sangeetha and Faisal, 2015; Oforkansi and Oduola, 2016; Inyang et al., 2018, Fawohunre et al., 2019),

Fried Banana Chips: Chips / crisps are one of the major processed banana products manufactured on a commercial scale in India. The market value of the chips industry was Rs. 500 crores and is expected to grow at 12.4% CAGR every year. Green banana chips are usually prepared by frying without peeling in oil or in vacuum fryer. Fried banana chips can have a storage life of about 1-2 months, if stored in polyethylene. Banana has low fat content and the calorie value of the chips increases after frying. The storage period of chips can be extended up to about 147 days, if stored at 25°C.

Banana flour: Banana flour is an important raw material for the bakery, confectionery and weaning foods industries. The demand for banana flour is increasing globally. Flour can be made from ground green bananas after dehydration. The steaming the banana before peeling makes the operation easier and reduces discoloration, retains more tannin, but requires more drying time. Fruits can be peeled by hand or by mechanical means and cut into 5–10 mm thick pieces. Generally open sun drying is followed. The new range of various innovative value added products from banana flour such as slowly digestible cookies and high fiber breads are being developed across the Globe (Adeniji and Empere, 2001, Juarez-Garcia et al., 2006).

## CONCLUSION

Green banana is a versatile fruit and can be used as staple food. As it cannot be eaten raw, therefore it can be processed for wide range of value added products such as chips, powder, dehydrated green bananas. The development of banana processing industries in production catchment area will help in employment generation of rural youth and will reduce the post-harvest losses to some extent.

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