Agri Articles
(e-Magazine for Agricultural Articles)
Volume: 04, Issue: 01 (JAN-FEB, 2024)
Available online at http://www.agriarticles.com
©Agri Articles, ISSN: 2582-9882

Review on Banana Value Addition Products

(*Shilpa Rathore, Dr. Vijay Bahadur, Dr. Annjoe V. Joseph, Dr. Sameer E. Topno and Dr. Shikha Singh)
Department of Horticulture, SHUATS, Naini, Prayagraj, Uttar Pradesh
*Corresponding Author's email: shipurathore@gmail.com

Value added products of processing banana include banana flour, dough, chapatti, banana kheer, bread, beer, cookies, and flour. These products are made by processing different varieties of banana, such as Cavendish and indigenous North East Indian banana varieties . The processing of banana for value added products alters the physico-chemical qualities of the fruit, resulting in changes in pH, titratable acidity, moisture content, total soluble solids (TSS), and vitamin C . The value added products also exhibit sensory, nutritional, enzymatic, and non-enzymatic properties, such as carbohydrate and protein content, free fatty acid content, DPPH scavenging activity, ascorbic acid percentage scavenging value, and enzyme activities . These products contribute to the utilization of banana waste and by-products, which are rich in phytochemicals and antioxidants, for medicinal and nutritxional purposes .

Introduction

Banana fruits are available in plenty in the Tropical countries like India, and a sizeable quantity of this fruit is wasted due to poor transportation and storage facilities. Therefore processing and product development using bananas is of utmost importance. Various processed products like figs, clarified juice, banana powder, flour, starch, jam, chips, stem candy and fermented products like ethanol, brandy and beer are prepared and used commonly in India.

Banana Figs

- Drying of ripe banana in sun or by mechanical methods has yielded palatable, soft and non-sticky product called banana figs, which can be stored for some months, in cardboard cartons lined with polythene.
- Gros Michel, High Gate, Robusta, Harichal, Red banana, Kunnan and Nakitechi, Pachakadali and Thenkunnan varieties are suitable for the preparation of banana figs.

The following procedure is generally followed for the preparation of banana figs:

- Take 5 kg of bananas, 1/2 tea spoon sodium bicarbonate, 2 litres of water, and 5 g of sulphur in a china dish.
- Select any variety of ripe banana, remove the peels and cut into slices with a stainless-steel knife. Immerse in sodium bicarbonate solution.
- Place on wooden slat trays or trays made of bamboo stick. Sulphur them for one hour by placing the trays in a sulphuring box having a dish containing sulphur.
- Dry them in the sun everyday, turning the sides till they are well dried. Home drier can also be used at 55^0 - 60^0 C for 20 hours. Store them in air-tight tins.

Osmotic Dehydration of Banana

- Banana can be dehydrated by osmosis in sugar syrup at 70 per cent concentration.

- The fruit will be reduced to about 50 per cent of its original weight by the process of osmosis, after which it is drained, washed and vaccuum dried which gives best product.
- Flavour, colour, appearance and texture attributes are maximally retained in osmotically dried products.
- The dehydrated products can be preserved upto one year or more, depending upon the packaging material used and storage condition.

Starch

- A process for the manufacture of starch from banana pseudostem has been evolved.
- The paste was somewhat longer than that of corn starch, but appreciably shorter than tapioca starch paste. Gelled banana starch was nearly as strong as corn starch and was nearly as opaque and reflective.
- Banana and corn starch might compete for the same market, their success being affected by transport costs.

Preparation of Banana Powder

- Raw bananas should be allowed to ripe in the Laboratory in an incubator at 180 – 200 C and a RH of 68-75% till the fruit becomes soft.
- The fruits are then peeled and pulp was then cut into small pieces with a stainless steel knife. The macerated pulp is then dried at 600 C under 58 cm of vaccuum. After 9 hours the dried product is pulverised and passed through a 50 mesh sieve and the powder is stored in air tight polythene bags in air tight containers.
- Spray drying of banana pulp yielded banana powder which is a hygroscopic material needing special care for preventing infection.
- Banana powders were found to contain many of the nutrients that were normally required for the general well being of the body.

Banana Juice

- An enzymic method has been developed by some to obtain clear and sparkling juice from banana pulp having the taste and flavour of original fruit.
- The juice so obtained can be bottled under suitable conditions. It can also be concentrated into an amber coloured product with honey consistency which can be used for the preparation of banana juice drink.
- Ripe banana fruits of Cavendish variety should be washed, peeled and the flesh was pulped in waring blenders.
- The pulp should be heated to 65° - 75° C for inactivating. This pulp should be cooled at 40° C, Calculated quantity of pectic enzyme concentrate (PEC) should be added to the pulp, mixed thoroughly and should be allowed to stand for sometime.
- When Cavendish variety of banana is used as raw material-agitation of the pulp for one hour after the addition of enzyme was found to be beneficial for processing.
- The enzyme d'sage of 0.75 – 1 per cent (V/W of pulp) was found to be optimal.
- Preheating of the pulp and addtion of a preservative potassium metabisulphite (KMS) was found to be good for obtaining a quality clarified juice as product.

Banana Flour and Chips

Banana Flour

- The fruit is dried to a limited extent in the tropics in dryers of various types. Green fruit is peeled after loosening the skin by blanching.
- The peeled fruit is sulphured for a short time, dried on trays until brittle, ground and milled into banana flour.

Banana chips

- Banana chips is one of the processed products of banana which can be produced easily and if proper packaging is provided will store well for months together.
- In Kerala State, the Nendran(AAB) plantain banana are made use of for the preparation of chips. As there is steady, and ready market for the product all throughout the year, both within and outside the state, Nendran banana chips are produced throughout the year, subject to the availability of raw unripe fruits.
- The general procedure for the preparation of deep-fat fried banana chips are the following.
- The fully mature, unripe, good sized 'Nendran' banana fruits are harvested. The fresh fingers are separated from hands, washed and drained off to remove any dust on the peel.
- Then the fingers are hand peeled by stainless steel knives and sliced into 1.75 to 2.0 mm thick slices by an adjustable stainless steel hand slicer.
- Chipping oil in the frying pan at 1600 – 1700 C when the oil reaches the smoke point.
- The frying medium: material ratio should be somewhere around 4:1. Common salt at the rate of 0.6 per cent (W/W added as 20 per cent aqueous solution) is sprinkled over the frying chips in the pan towards the end of frying. The fried chips are removed from the frying pan drained off the oil and immediately packed in air tight tin containers.
- Nendran bananas harvested between 85 and 95 days after the emergence of inflorescence are most suitable for deep-fat frying into chips.

Limitations and challenges associated with value addition

- Water scarcity along with saline soils, which affects agricultural production and thus may affect the quality of the value-added product;
- Insufficient awareness to deal with postharvest losses.
- Increase in foreign labor that may affect production efficiency of the value-added products (unskilled labor).
- Considering the farm's income as secondary income (not main income) so they are more concerned with their primary jobs and devote themselves to their farms only in their free time.
- The farm owners focusing on the primary job more than the farm and treating farm revenue as a secondary source of income (rather than a primary source of income) which may affect the farm production of value-added products.
- Lack of links between farm owners and investors to improve the value addition production.
- Lack of technology transfer used to improve the value addition production.
- Lack of awareness in knowing the efficiency of the value addition that may increase production.
- Lack of benefit from scientific expertise and modern techniques in the production of value-added date products (technology transfer) .
- Lack of workshops and educational programs that develop farmers' skills (capacity building).
- Weakness in marketing and in making a wide and well-known brands in the world for many agricultural products, such as dates .
- High production cost, with many losses of dates and outbreak of diseases .

Suggested solutions

- Need to increase the efficiency and skills of farmers in increasing the production while reducing postharvest losses;

- Improving the technology transfer at farm level to increase the production of the value-added products;
- Educational workshops for farmers, organized by the Ministry of Agriculture or any competent investment entity, to develop farmers' competence in many agricultural activities;
- Using the postharvest crop losses for value addition process;
- Deep consideration of the concept of the added value of crops will raise farm production and expand its income. Depending on it, technology is transferred and farmers' capacities are built so that the concept of added value is applied correctly by following international standards.

Conclusion

- Nowadays, there is an interest in reducing postharvest losses and finding solutions to increase the income of many farms, combat hunger and poverty, and raise the standard of living and food security.
- It can be done by using both technology transfer and capacity building that help introduce the value addition concept of agricultural products to increase the production, create a new product, and improve the postharvest treatments that contribute to agricultural sustainability.
- Value-addition aims to increase the availability of the commodity, provide off-farm employment opportunities, enhance capacity building, increase trade, and get a pathway out of poverty.

References

1. FAO I. Food loss and waste must be reduced for greater food security and environmental sustainability; 2020.
2. Narayan Lal, Nisha sahu ,Govind shiurkar,2017, Banana:Awesome fruit crop for society, the pharama innovation on Journal vol 6, ISS 7 PP 223-228
3. Demirel, D., & Turhan, M. (2003). Air-drying behaviour of dwarf Cavendish and Gros Michel banana slices. Journal of Food Engineering, 59(1), 1–11
4. Jasmine L Rasheed, 2005**,** value addition in Banana **(**Musa spp),Department of processing technology, college of agriculture, vellayani,172494,14.139-185.57