

A
Project Report
On

“Beetroot Jam”

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ARTS, COMMERCE AND SCIENCE COLLEGE, SONAI, AHMEDNAGAR

In partial fulfillment of the requirements for the degree of

Bachelor of Vocational

**In
FOOD PROCESSING (DAIRY TECHNOLOGY)**

By

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MULA EDUCATION SOCIETY'S
ARTS, COMMERCE AND SCIENCE COLLEGE, SONAI, AHMEDNAGAR
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CERTIFICATE

Certified that **LAWANDE RUSHIKESH RANJAN AND SHAIK RIYAZ RAFIK** has carried out the project work entitled "**Beetroot Jam**" for the award of the degree of Bachelor of Vocational (Food Processing) from Mula Education Society's Arts, Commerce and Science College, Sonai, Ahmednagar under my supervision. The project embodies results of original work, and studies are carried out by the student himself and the contents of the project work do not form the basis for the award of any other degree to the candidate or to anybody else from this or any other University/Institution.



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Study on development of Beetroot Jam Storable products

Abstract

Beta Vulgaris is generally known as beetroot. It is a wonderful dietary supplement because it is not only rich in nutrients, minerals, and vitamins but it also has unique phytoconstituents, which have various therapeutic importance such as ant-oxidant, anti-depressant, anti-microbial, anti-inflammatory, diuretic, and expectorant. But beetroots are not liberally available in every season. So there is a requirement to preserve this vegetable. The objective of the present study was to develop some value-added storable (beetroot biscuits, beetroot pickle, and beetroot jam) products from beetroot and to assess their shelf life. All the storable products were kept at room temperature (29-30 0C) for 3 months and analyzed for their shelf life at 0, 15, 30, 45, 60, 75 and 90 days with sensory characteristics by using the Nine-point hedonic scale and microbiological analysis by using Pour Plate Technique. The result showed that beetroot biscuit and beetroot pickle can consume up to 75 days of storage but beetroot jam can be consumed up to 60 days of storage. However, the microbial load of all the storable products was within the acceptance range for 3 months of storage so they can store up to 3 months and also safe for consumption

Keywords: beetroot biscuit, beetroot pickle, beetroot jam, TPC, Nin-point hedonic scale

I. Introduction

It is well-documented that consumption of fruits and vegetables have many health benefits and it has led to growing interest in so-called “functional food” and reduced the risk of many non-communicable and chronic diseases. Beetroot (Beta Vulgaris) is the taproot portion of beet plant. It is one of the original “super food” .3Beetroots are ranked among ten most powerful vegetables with respect to its antioxidant capacity and total phenolic content of 50-60 μ mole/g dry weight. Beetroot is a potential source of valuable nitrogenous pigments called betalins . Numerous studies have proven that beetroots have many therapeutic importance such as hepatoprotective, anticancer, antiinflammatory, antihypertensive, antibacterial, antimicrobial, antidiabetic, cardioprotective, beneficial in dementia and many others. But beetroots are not available in liberal amount in all seasons . So there is a requirement to preserve this vegetable for taking its benefit in all seasons. Keeping this view the present study is planned to carry out this work with following objective.

II. Materials and Methods

1.1. Procurement of raw materials

Beetroots which were used in this research were procured from Ghala farm, Hardoi by pass road, Lucknow (U.P). However refined wheat flour, fat, sugar , sugar, baking powder vanilla essence, Curd, spice mixed , salt, vinegar, mustered oil, apples and citric acid were purchased from local market of Aminabad, Lucknow .

1.2. Processing of beetroot powder

Beetroot powder (BRP) which was used for the preparation of beetroot biscuits were prepared by following steps. Firstly fresh beetroots were washed with tap water and chopped into small pieces. After that it was dried in hot air-circulated oven at 600C for 11-12 hours for complete dryness. Then the dried beetroots were grinded by electric grinder.

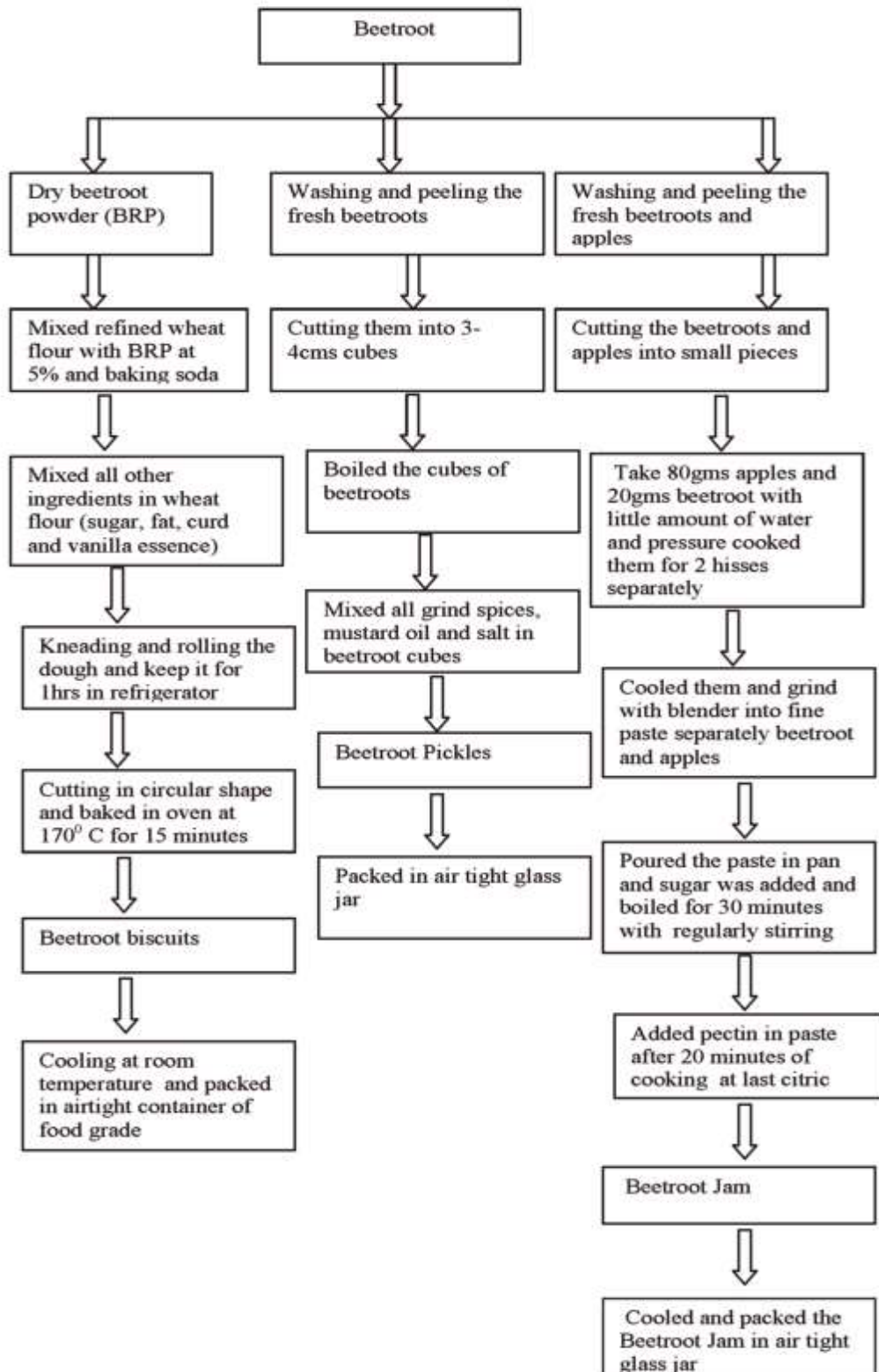


Fig. 1 Formulation of some storable products from beetroots

1.4. Shelf life analysis of storable products

All the samples of storable products of beetroot (beetroot biscuits, beetroot jam and beetroot pickles) were kept room temperature (29-30 °C) for 3 months and they were analyzed for their shelf life in ways i.e. by sensory evaluation and microbiological analysis.

1.5. Shelf life by sensory evaluation

The shelf life of all the storable products were analyzed by sensory characteristics by using Nine-Point hedonic scale with semitrained panel of ten judges from School of Hotel Management, Babu Banarasi Das University, Lucknow and Era's Lucknow Medical Collage and Hospital at 0, 15, 30, 45, 60, 75 and 90 days of interval .The panelists were asked to evaluate the products for different sensory attributes namely color, appearance, Aroma, Texture, Taste, and overall acceptability.

1.6. Shelf life by microbiological analysis

In microbiological analysis the shelf life of all the storable products were analyzed by using Pour Plate technique at Regional Food Research and Analysis centre, Lucknow at same interval. The TPC (total plate count) and Y& M (yeast and mould) were analyzed by applying following methods.

III. Result and Discussion

In present study , three storable value-added products of beetroots were prepared and preserved at room temperature (29-30 0C) for three months and every 15 days of interval these products were evaluated for their sensory attributes for colour, appearance, aroma, texture, taste and overall acceptability scores and the result for their shelf life are given in Table 1. On sensory evaluation of beetroot biscuits the mean score of colour at 0 to 54 days of storage were felt in the category of ‘moderately liked’. However at 60 to 75 days of storage it was in the ‘slightly liked’ category. After that at 90 days of storage it was categorized in ‘Neither like nor dislike’ category. The significant difference ($p < 0.05$) in the colour of beetroot biscuits were found at 0 to 90 days of storage.

It was observed that upto 75 days all the values of color of beetroot biscuits were within the acceptance range but at 90 days of storage it goes below the acceptance range. However in appearance at 0 to 75 days of storage the mean scores were ranged between ‘moderately liked’ to ‘slightly liked’ category. But at 90 days the mean score was lying in ‘neither liked nor disliked’ category. So at 0 to 75 days of storage the mean score of appearance of beetroot biscuits were within the acceptable range. Although 90 days of storage it was not in the acceptable range. The aroma, texture and taste of beetroot biscuits at 0 to 60 days of storage the mean were ranged between ‘moderately liked’ to ‘slightly liked’ category. However at 75 days to 90 days of storage the values were ranged between ‘slightly liked’ to ‘neither liked nor disliked’ category. Therefore the aroma and texture of beetroot biscuits at 0 to 60 days were within the acceptable range but at 75 to 90 days of storage the mean score values were

not in the acceptable range. But the taste of beetroot biscuits were within the acceptable range at 75 days of storage and at 90 days of storage it was in non-acceptable range. The significant Difference ($p < 0.05$) was found in all the sensory attributes of beetroot biscuits at 0 to 90 days of storage. In beetroot pickle on storage all the sensory attributes from 0 to 45 days were lying in 'moderately liked' category. However, the color and appearance at 60 to 90 days of storage the mean values were lying between 'slightly liked' to 'neither liked nor disliked' category. But the aroma, texture and taste of beetroot pickles at 60 to 90 days of storage the mean values were lying in 'very much liked' category. The significant difference ($p < 0.05$) was found in all the sensory attributes of beetroot pickles at 0 to 90 days of storage. Although, after evaluating the status of shelf life of beetroot pickle for their all sensory factors, it was observed that up to 75 days of storage all mean score values of sensory attributes were within the acceptance range but after that at 90 days of storage the mean score value of color and appearance were not in the acceptance range.

On storage of beetroot jam the mean scores of all sensory attributes (colour, appearance, aroma, texture and taste) at 0 to 60 days of storage were rated in 'moderately liked' to 'slightly liked' category. However, at 75 to 90 days of storage the mean value of colour and aroma were lying in 'neither liked nor disliked' category. The mean value of appearance and texture at 75 to 90 days of storage were rated in 'liked slightly' to 'neither liked nor disliked' category. The taste of beetroot jam at 75 to 90 days of storage was lying in 'neither liked nor disliked' category. However, the significant differences were found in all the sensory factors at 0 to 90 days of storage. After evaluating the changes in all the sensory attributes it was observed that upto 60 days all the values were within the acceptance range but after that the mean score values of all the sensory attributes were gone below the acceptance range.

IV. Discussion

The present study agreed with Saeed et al. (2012) who reported that the gradual decreased in all sensory attributes of sweet potato flour incorporated biscuits during storage for 90 days⁶. Dhumal (2016) also reported that the sensory values of sweet potato flour incorporated biscuit was decreased due to storage and he described that the decreased in colour score during storage of sweet potato biscuits may be due to increased in the non-enzymatic browning reaction during storage period⁷. The present finding of sensory score of beetroot pickle was agreed with Hong et al. (2015) who reported that during storage the sensory attributes of pickles were declined⁸. Ullah et al. (2018) reported that the values of all sensory factor in carrot and apple jam were high at 0 day and lowest at 90 days of storage period and decline in colour score may be due to degradation of ascorbic acid and also enzymatic

browning reaction. However, decline in taste score may be due to fluctuations in acids or due to decreased in pH value.

In present study the shelf life study of beetroot biscuits by microbiological study was agreed with Seevaratnam et al. (2012) they noticed the similar trend in potato flour incorporated biscuits that after storage the bacterial count of biscuits were increased but they were lower than acceptable limit and the fungus growth were not observed during storage.¹⁰ However, in present study the shelf life study of beetroot pickle by microbiological study was agreed with Hong et al. (2015) that in pickles total number of colonies were increased with storage time⁸. In this study the shelf life study of beetroot jam by microbial count was agreed with Shakir et al. (2005) they reported that the total microbial count was increased with storage for 90 days in jam prepared with apples and pears.

V. Conclusion

Overall the result of the study indicates that the storable products developed (beetroot biscuits, beetroot pickle and beetroot jam) from beetroots can be store and consumed for 90 days of storage time. It was concluded that on sensory evaluation beetroot biscuit and beetroot pickle can be consume upto 75 days of storage but beetroot jam can be consumed up to 60 days of storage time but after that it goes below the acceptance range. However, the microbial load of all the storable products was within the acceptance range for 3 months of storage period and they are safe for consumption.