



P-ISSN: 2349-8528

E-ISSN: 2321-4902

www.chemijournal.com

IJCS 2020; 8(4): 2275-2278

© 2020 IJCS

Received: 04-05-2020

Accepted: 06-06-2020

J Prasoota

Department of Food and Nutrition, Post Graduate & Research Centre, PJTS Agricultural University, Rajendranagar, Hyderabad, Telangana, India

B Anila Kumari

Department of Food and Nutrition, Post Graduate & Research Centre, PJTS Agricultural University, Rajendranagar, Hyderabad, Telangana, India

Supta Sarkar

Department of Food and Nutrition, College of Community Science, PJTS Agricultural University, Hyderabad, Saifabad, Telangana, India

V Kavitha Kiran

Department of Human Development & Family Studies, AICRP – Home Science, PJTS Agricultural University, Rajendranagar, Hyderabad, Telangana, India

R Swamy

Department of Agricultural Process & Food Engineering, Institute of Agricultural Engineering & Technology, Agricultural College, PJTSAU, Rajendranagar, Hyderabad, Telangana, India

Corresponding Author:**J Prasoota**

Department of Food and Nutrition, Post Graduate & Research Centre, PJTS Agricultural University, Rajendranagar, Hyderabad, Telangana, India

Development of carrot and beetroot greens incorporated instant chutney powder

J Prasoota, B Anila Kumari, Supta Sarkar, V Kavitha Kiran and R Swamy

DOI: <https://doi.org/10.22271/chemi.2020.v8.i4z.9970>

Abstract

The low cost, underutilized vegetable processing and value addition is very much important to minimize huge post-harvest losses to a greater extent for nutritional security of large section of population. In present study instant chutney powder was developed by using underutilized leafy vegetables such as carrot leaves and beetroot leaves with different ratios which were feasible to mix as ready to eat instant chutney powder. The carrot and beetroot leaves were blanched for 3 minutes and then dried for about 10-12 hours. The dried carrot and beetroot leaf powder was added to standard chutney powder in different ratio and subjected to sensory evaluation. The standard powder is added with different ratios of carrot leaves and beetroot leaves. The best combination which was selected is CBCP₂ (1:2 ratios of carrot leaves and beetroot leaves). It was noted that 50% of standard mix when mixed with 50% of both carrot leaves and beetroot leaves was accepted better rather than only standard powder.

Keywords: Beetroot leaves, carrot leaves, blanching, dehydration, standardisation, chutney powder, sensory evaluation

Introduction

The traditional methods of preparations like chutneys, pickles and chutney powders were consumed along with rice, breakfast items such as vada, idly, dosa, chapathi, upma and samosa, and various snack foods, etc., as a side dish, which also increase appetite and craving (Jyothirmayi *et al.*, 2006) [3].

In the current situation where the absence of popularization programme, mobilization of farmers and consumers of all classes towards better utilization of these underutilized leafy vegetables, inadequate facilities towards processing and value addition, bottlenecks in research, weak policy support from different organizations, in adequate marketing facilities and supply chain are the main reasons due to which these crops still remained underutilized. Underutilized leafy vegetables are excellent sources of proteins, vitamins, minerals including micronutrients. The high and diversified nutritional qualities indicated that the cultivation and consumption of these crops may be helpful in overcoming the nutritional deficiencies which was major in many rural areas of the country and helpful to boost the socio-economic condition of the society (Prasad, 2018) [6].

Betalains has antiviral effects and also can inhibit the cell proliferation of human tumour cells (cancerous cells). Significant amount of vitamin C, vitamin B₁, B₂, niacin, B₆, B₁₂ were found in beetroot, while the leaves itself are rich source of vitamin A consuming beetroot helps in curing many diseases such as anaemia, blood pressure, cancer, dandruff, gastric ulcers, kidney ailments, liver toxicity or bile ailments like jaundice, hepatitis, food poisoning, diarrhoea and vomiting (Neha *et al.*, 2018) [5].

Many vegetable leaves, especially underutilized vegetables including those of carrot (*Daucus carota* L.), were wasted and there was lots of post-harvest losses. Carrot leaves are excellent source in both nutrients such as vitamin C, β-carotene, fibers and several minerals such as Na, P, K, Ca, Mg, Mn, Zn, and Fe. Carrot leaves had a high protein, carbohydrate and potassium content in it (Goneim *et al.*, 2016).

Blanching is basically a thermal treatment which is usually conducted before to food processing methods such as drying, canning, freezing etc. This process involves heating of fruits and vegetables quickly to a fixed temperature and maintaining it for a given period of

time, i.e. between 1 to 10 minutes in water. Blanching process helps in removing the air which has been trapped in the cells of fruits and vegetables while its colour and flavour will be enhanced (Trivedi *et al.*, 2018) [7].

Green leafy vegetables (GLVs) are multi-cultural components used ubiquitously in Indian cuisine. They were rich sources of calcium, iron, β -carotene, vitamin C, dietary fiber and many trace minerals. In recent years, enormous efforts have been made for an improvement in the nutrient retention of dried products by altering processing methods and pre-treatment in green leafy vegetables. Blanching was a prerequisite for preservation of green leafy vegetables for longer time. The dehydrated GLVs were a greater source of dietary fiber which can find application in development of high fiber and micronutrient rich foods (Gupta *et al.*, 2011).

Consumers can be attracted to these lowcost processing technologies for serving the needs of offseason vegetables. Furthermore, consumers in cities have very little time to cook vegetables daily and cater the nutritional and sensory perception of vegetables. The demand of convenience form of vegetables in form of easy-to-cook, ready-to-eat vegetables is increasing with time. Therefore, the instant chutney powders were developed as a ready to eat breakfast or a snack product which increases the feasibility for consumers.

Materials and methods

Process description of underutilized leafy vegetables (ULV) incorporated instant chutney powder

Pre-processing of selected underutilized leafy vegetables:

All the samples of leafy vegetables collected were washed thoroughly in running tap water to remove dust and dirt followed by distilled water. The tender part of stems and foreign material were removed and edible portion were separated.

Blanching: Blanching is one of the pre-treatment given to vegetable before drying to minimize the microbial load and deactivate the enzymatic activity to prevent the browning reaction. Carrot and beetroot leaves were blanched by immersion in hot water for 3 minutes. After blanching green leafy vegetables were immersed in 0.2 per cent potassium meta bisulphate solution and the extra water was drained.

Drying: The leafy vegetables were dried using a cabinet dryer at 55 ± 2 °C for 10-12 hours to reach desired moisture level (9-10%) and until samples became crisp and brittle to touch. After drying the samples were powdered (1.0 mm mesh) and stored in an airtight container and kept in a refrigerator for further usage.

Preparation of instant chutney powder from ULV: The unit operations involved in the preparation of underutilized leafy vegetable incorporated instant chutney powder is presented in Figure 1.

Roasting: All the ingredients like black gram dhal, Bengal gram dhal, cumin and coriander seeds were dry roasted separately up to development of flavor.

Powdering: All the roasted ingredients were powdered in blender and packed in air tight jars for further use

Weighing: All the ingredients were weighed individually according to the proportions of each formula as given in the Table 1.

Blending: All the powdered and weighed components were mixed, blended in a food processor and packed in air tight container and stored at room temperature and used for further analysis (Plate 1 and Plate 2).

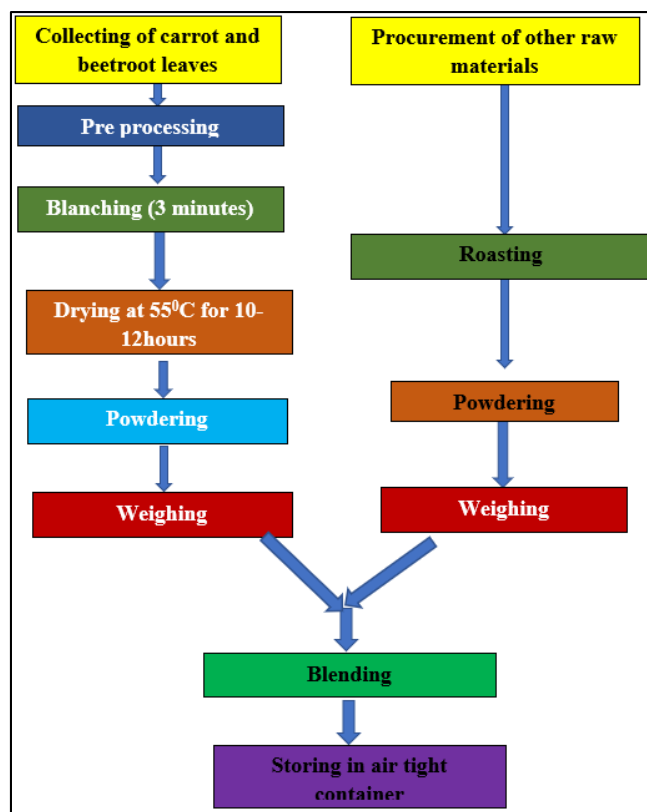


Fig 1: preparation of instant chutney powder

Table 1: Proportions of the ingredients used in standardization of ULV incorporated chutney powders

Ingredients	CNCP	CBCP ₁	CBCP ₂	CBCP ₃
Dried carrot leaves	0.0	25.0	25.0	50.0
Dried beetroot leaves	0.0	25.0	50.0	25.0
Black gram dhal powder	4.0	4.0	4.0	4.0
Bengal gram dhal powder	2.5	2.5	2.5	2.5
Cumin powder	2.5	2.5	2.5	2.5
Coriander seed powder	5.5	5.5	5.5	5.5
Garlic	5.5	5.5	5.5	5.5
Tamarind powder	7.0	7.0	7.0	7.0
Red chilli powder	10.0	10.0	10.0	10.0
Common salt	13.0	13.0	13.0	13.0

Note: All formulae were repeated three times.

All ingredients were measured in grams

CNCP: Control instant chutney powder

CBCP₁: Carrot and beet root leaves (1:1) incorporated instant chutney powder

CBCP₂: Carrot and beet root leaves (1:2) incorporated instant chutney powder

CBCP₃: Carrot and beet root leaves (2:1) incorporated instant chutney powder

Sensory evaluation: Acceptance was tested by sensory evaluation using 9-point hedonic scale at PGRC, PJTSAU where each product was coded with three-digit number and is tested by 10 semi-trained panellists. They were asked to score the product based on the sensory parameters like appearance, colour, flavour, texture, chewiness, taste and overall acceptability. They were provided water to rinse the mouth for avoiding over lapping of taste of other powders and scored

from 1 – 9 with 1 being I dislike extremely *i.e.*, very bad and 9 being I like extremely *i.e.*, the product is excellent in that particular attribute (Meilgaard *et al.*, 1999) [4].

Results and discussion

Standardization of underutilized leafy vegetables (ULV) incorporated instant chutney powder

Many vegetable leaves, including those of carrot (*Daucus carota* L.) and beetroot (*Beta vulgaris* L.) are squandered. In markets and fruit and vegetable distribution centers, their leaves are cut off from the bulb to be used as organic fertilizer and animal feed or discarded into the environment as waste. Carrot and beetroot leaves are very rich in nutrients such as vitamin C, β -carotene, fibers and several minerals such as Na, P, K, Ca, Mg, Mn, Zn, and Fe (Gehan *et al.*, 2011) [1]. They have a pleasant taste and characteristics suitable for processing. They may be used for the preparation for value added products.



Plate 1: Standard instant chutney powder



Plate 2: CBCP₂-1:2 (Carrot leaves: beetroot leaves)

Thus in the present study instant chutney powders were developed by incorporating blanched and dried carrot and beetroot leaves in different proportions. The developed products were subjected to sensory evaluation and the results are statistically analysed and presented in Figure 2.

Among the four samples highest score for appearance was given to CBCP₂ (8.80±0.42) whereas all other products were same. The highest mean sensory score for colour was given to CBCP₂ (8.80±0.42) followed by CBCP₁ and CBCP₃ (8.00±0.00), whereas the control sample CNCP score was low (7.20±0.42) for the colour parameter.

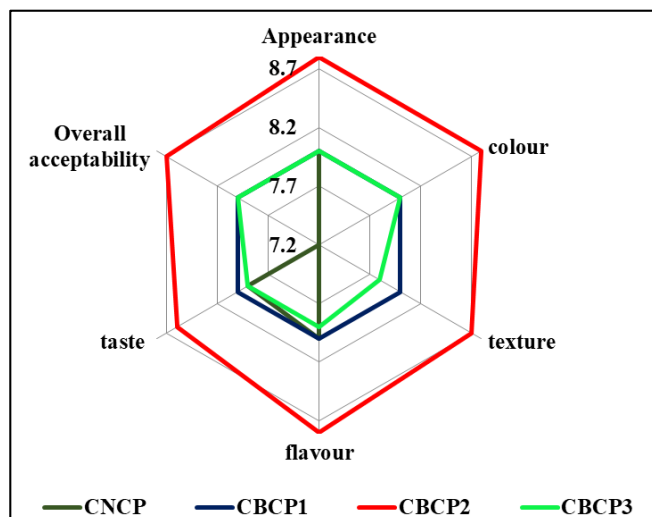


Fig 2: Mean sensory scores of ULV incorporated chutney powders

Note: All formulae were repeated three times.

All ingredients were measured in grams

CNCP: Control instant chutney powder

CBCP₁: Carrot and beet root leaves (1:1) incorporated instant chutney powder

CBCP₁: Carrot and beet root leaves (1:2) incorporated instant chutney powder

CBCP₁: Carrot and beet root leaves (2:1) incorporated instant chutney powder

The ascending order of mean sensory scores for texture was 7.20 ± 0.42 (CNCP) > 7.80 ± 0.42 (CBCP₃) > 8.00 ± 0.00 (CBCP₁) > 8.70 ± 0.67 (CBCP₂). The mean highest sensory for flavour was given to CBCP₂ (8.88 ± 0.63) followed by CBCP₁ and CNCP (8.00 ± 0.00) and lowest score was given to CBCP₃ (7.90 ± 0.31). The mean sensory score for taste in ascending order is CBCP₃ > CNCP > CBCP₁ > CBCP₂ (7.90 ± 0.31) > 7.90 ± 0.56 > 8.00 ± 0.00 > 8.60 ± 0.84). The overall acceptability of mean sensory scores was 8.70 ± 0.67 (CBCP₂) > CBCP₁.

The Figure 4 clearly shows that among the four combinations CBCP₂ has scored highest for all the sensory parameters when compared to the control and also with the experimental samples. The difference was significant at ($p \leq 0.05$).

Conclusion

Thus it can be concluded that the instant chutney powders with the underutilized carrot leaves and beetroot leaves were having a greater health benefits and contain many nutrients. The study showed that the underutilized green leaves combinations were given priority and also sensorially accepted well by the panel members. It is importance to reduce the post harvest losses and also give value addition to the underutilized green leafy vegetables in the diet.

Acknowledgement

The authors thank honourable Vice Chancellor of Professor Jayashankar Telangana State Agricultural University, Rajendranagar, Hyderabad for his encouragement.

References

- Gehan GA, Ibrahim FY, hehawy SM. Carrot leaves: antioxidative and nutritive values. Food Industries Department, Faculty of Agriculture, Mansoura University, Egypt. 2011, 1-9.

2. Gupta S, Gowri BS, Lakshmi AJ, Jamuna Prakash. Retention of nutrients in green leafy vegetables on dehydration. *Journal of Food Science and Technology*. 2013; 50(5):918-925.
3. Jyothirmayi T, Narsing Rao G, Govardhana Rao D. Studies on instant raw tamarind chutney powder. *Journal of Foodservice*. 2006; 17:119-123.
4. Meilgaard M, Civille GV, Carr BT. *Sensory Evaluation Techniques*. 3rd Ed. CRC Press, Boca Raton, 1999.
5. Neha P, Jain SK, Jain NK, Jain HK, Mittal HK. Chemical and functional properties of Beetroot (*Beta vulgaris* L.) for product development: A review. *International Journal of Chemical Studies*. 2018; 6(3):3190-3194.
6. Prasad BVG, Munsu P, Chakravorty S. Underutilized leafy vegetables: diversity, nutritional security and medicinal benefit in context of eastern India. *Advances in biodiversity conservation for sustainable development*. 2018, 95-104.
7. Trivedi A, Saraswat S, Priya Yadav. Effect of blanching on green vegetables. *University Research Resource Journal Jayoti Vidyapeeth Women's University*. 1(2):218- 225.