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Standardization and development of beetroot based product

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Abstract
The objective of present investigation was refer to-"standardization and development of beet root based product''. Beetroot is of exceptional nutritional value; especially the greens, which are rich in calcium, iron and vitamins A and C. Beetroots, are an excellent source of folic acid and a very good source of fibre, manganese and potassium. Per 100 gram serving providing 43 calories, beetroot is an excellent source (20% of the Daily Value, DV) of folate and a good source (14% DV) of manganese, with other nutrients in low amounts (see table displayed at right). The green, leafy portion of the beet is also edible. Beetroot, also known simply as the beet, has been gaining in popularity as a new super food due to recent studies claiming that beets and beetroot juice can improve athletic performance, lower blood pressure and increase blood flow. Beetroot has been gaining in popularity as a new super food. Increasing consumption of plant foods like beetroot decreases the risk of obesity and overall mortality, diabetes, heart disease and promotes a healthy complexion and hair growth. The nutritive value of most acceptable was calculated with the help of "Food Composition Table" given by ICMR (2010). Develop product of oats was used for development of standardized products i.e. Lassi and Halwa. The organoleptic evaluation of products was done by using score card method (9-Point Hedonic Scale). The result of beet root based products, for Lassi and Halwa. (T1) were best in all treatments in case of all sensory attributes. The highest average score for all acceptability was found in experimental products made by developed by beetroot based were mostly accepted by panel member.

Keywords: Blood pressure

1. Introduction
Beetroot is the taproot portion of the beet plant, usually known in North America as the beet, also table beet, garden beet, red beet, or golden beet. It is one of several of the cultivated varieties of Beta vulgaris grown for their edible taproots and their leaves (called beet greens). These varieties have been classified as B. vulgaris subsp. vulgaris Conditiva Group.
Like many modern vegetables, beetroot was first cultivated by the Romans. By the 19th century it held great commercial value when it was discovered that beets could be converted into sugar. Today, the leading commercial producers include the USA, Russia, France, Poland and Germany. Many classic beetroot recipes are associated with central and Eastern Europe including the famous beetroot soup known as borscht.
Beetroot is of exceptional nutritional value; especially the greens, which are rich in calcium, iron and vitamin A and C. Beetroots are excellent source of folic acid and a very good source of fibre, manganese and potassium. The greens should not be overlooked; they can be cooked up and enjoyed in the same way as spinach. Beetroots have long been used for medicinal purposes, primarily for disorders of the liver as they help to stimulate the liver's detoxification processes. The plant pigment that gives beetroot its rich, purple-crimson colour is betacyanin; a powerful agent, thought to suppress the development of some types of cancer.

2. Objective
1. To standardize and develop the products using beetroot.
2. Organoleptic evaluation of developed products.

3. Materials and method
The experimental works will be carried out in the research laboratory of the Faculty of Home

Sciences at Kamla Nehru Institute of Physical and social Sciences, Sultanpur. Various materials and researching techniques have been used throughout this experiment.

The present investigation entitled "standardization and development of Beetroot based products" was carried out to standardize beetroot and its products. The study was conducted in department of food and nutrition, faculty of home science, KNIPSS, Sultanpur.

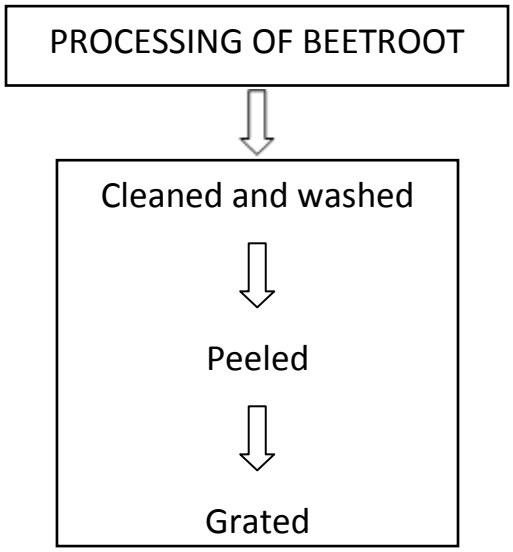
Justified, judicious and scientific methodological consideration is indispensable for any investigation to deduce meaningful interferences concerning the objectives of the study. The study design reflects to the logical manner in which units of the study are assessed and analyzed for the purpose of drawing generalizations. Thus, with the view of available resources, the best procedures for taking correct observation should be first sorted out in a logical manner so that unbiased interference can be drown. This chapter delineates information pertaining to the research design and methodological steps used for investigation. The research procedure has been distinctly described as under in the following heads:

3.1 Procurement of material.
3.2 Processing of raw material.
3.3 Development of Beetroot based products.
3.4 Sensory evaluation.
3.5 Calculating nutritive value.
3.6 Statistical analysis.

3.1 Procurement of material

For the present investigation material e.g., beetroot was produced from the local market of Sultanpur city. The procuring was done in single a lot to avoid variation compositional differences so that the quality differences should be ruled out.

3.2 Processing of raw material



3.2.1 Processing of Beetroot

This material was subjected to cleaning, washing and grating in the following manner.

Cleaning and washing

Beetroot was washed 1 times with tap water and then rinsed with water to remove dirt, dust and other adhering impurity.

Peeling and grating

Beetroot was peeled by peeler, and then grated by grater in slices

3. 3 Development of Beetroot based products

The slices was used for product development as follows:

Table 1: Beetroot Halwa

Ingredients	Amount	
	Controlled (T0)	Experimental (T1)
Grated beetroot	-	100 g.
Ghee	4 tbsp.	4 tbsp.
Khoa	100g.	50g.
Sugar	50g.	100g
Cardamom powder	a pinch	a pinch
Almond	10	10
Cashew nuts	10	10

Method

- Melted the ghee or butter in a kadai or saucepan.
- Added the beetroot and roast stirred them for 4-5 min.
- When they get browned, added milk in it and stirred it.
- After few minutes, added khoa and sugar in it.
- Continued stirred for 10 min.
- Putted the flamed off.
- After that added the green cardamom powder and mixed it well.
- Take the halwa on a plate and form into a layer of 1 inch thick square.
- Decorated the halwa with halved almonds and cashew nut.
- When cooled, cut into squares.

Table 2: lassi

Ingredients	Amount		
	Controlled (T0)	Experimental (T1)	Experimental (T2)
Beetroot pulp/juice	-	5g.	5g.
Green chilies	-	1	-
Salt	-	To taste	-
Fennel powder	-	A pinch	-
Butter milk	50g.	50g.	50g.

Method

- Take the glass jar and add beetroot, green chilies, salt and blend it once.
- Add little water and stain the juice into a bowl.

- Transfer the juice into another glass jar and add fennel powder, again blend it.
- Add butter milk and blend it and check for seasoning.
- Transfer it into a glass.
- Now the pink colour beetroot lassi is ready to serve.

Result and discussion

The data were collected on different aspects per plan were tabulated and analyzed statistically. The result from the analysis presented and discussed chapter in the fallowing sequence.

4.1. Calculation of nutritive value of beetroot.

4.2. Organoleptic evaluation of beetroot based products.

4.1.1. Calculation of nutritive value of beetroot:

Table 3: Hundred grams of ground beetroot contain:

Nutrients	Total
Energy	1,628 kJ (389 kcal)
Fat	6.9 g
Carbohydrates	66.3 g
Fibres	10.6 g
Protein	16.9 g

The nutritive value of most acceptable was calculated with the help of "Food Composition Table" given by ICMR (2010). Table shows that the total energy, protein, fat and CHO. Value of most acceptable beetroot was 1,628 kcal. 16.9g. and 6.9g. Acceptability.

4.2.1. Organoleptic evaluation of beetroot based products.

- Flavor and taste.
- Body and texture.
- Color and appearance.
- Over all acceptability.

Table 4.2.2: Organoleptic evaluation of beetroot halwa -

Product	Flavor& taste	Body \ texture	Color & appearance	Overall acceptability
T0(controlled)	7.4	7	7.2	7.6
T1(experimental)	8.8	8.3	8.3	8.8

Table 4.1 shows that the experimental (T1) obtained maximum 8.8, 8.3, 8.3 and 8.8 for flavor & taste, body & texture, color &appearance and overall acceptability; while controlled (T0) 7.4, 7, 7.2 and 7.6 obtained for flavor &taste, body & texture, color & appearance and overall acceptability respectively. This indicated that the controlled (To) halwa was found to be fallen under category of "Like Very Much to Like Extremely".

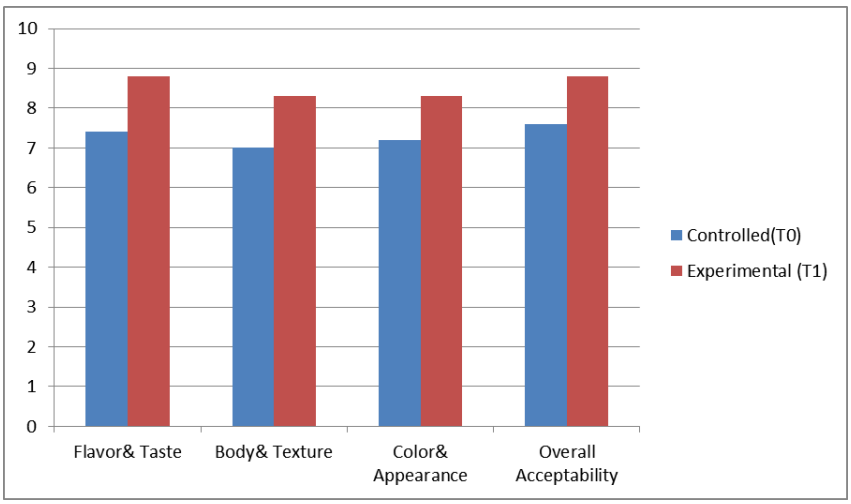


Fig 1: Mean overall acceptability of Halwa

Similarly, Viren Ranawana, Garry *et.al*, (2016) [5] studied that the oxidative and physical stability of the reformulated mayonnaise with processed beetroot was investigated and compared with a control (mayonnaise without beetroot) and a commercially available product. Processing of beetroot had an impact on the structural integrity of the antioxidants present. Microwaving (960 W for 7 min) was advantageous for preserving the betalain and polyphenol content of beetroot compared to roasting (180 °C for 90 min) and boiling (100 °C for 30 min). The oxidative stability of mayonnaise samples was determined by Rancimat and the thiobarbituric (TBA) assay. The addition of microwaved beetroot significantly enhanced the oxidative stability of mayonnaise at the end of a storage period of 4 weeks (4 °C). Although no significant differences ($P > 0.05$) were detected between the mayonnaise samples containing beetroot and the commercial control, the latter was less susceptible to oxidation during storage. The turbiscan stability index (TSI) revealed that the commercial mayonnaise was less prone to destabilization phenomena. All the textural parameters increased with the incorporation of beetroot. The sensory evaluation revealed that, with the exception of graininess and uniformity, most of the sensory attributes are preserved if not improved with the addition of beetroot.

Table 4.2.3: Organoleptic evaluation of beetroot Lassi

Product	Flavor& taste	Body \ texture	Color & appearance	Overall acceptability
T0(controlled)	7.5	7.7	7.5	7.6
T1(experimental)	9	9	9	9
T2(experimental)	9	8	8.5	9

Table 4.2 shows that the experimental (T1) 9, 9, 9 and 9 obtained maximum for flavor &taste, body texture, color& appearance and overall acceptability; while controlled (T0) obtained7.5, 7.7, 7.5 and 7. 6 for flavor &taste, body &texture, color& appearance and overall acceptability respectively. This indicated that the controlled (To) lassi was found to be fallen under category of "Like Very Much to Like Extremely".

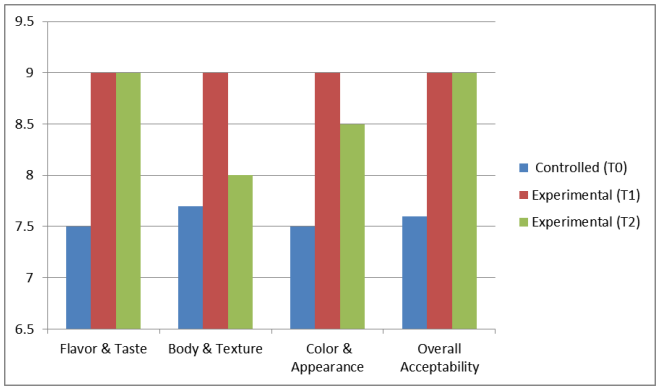


Fig 2: Mean overall acceptability of Lassi

Similarly, Tom Clifford *et.al*, (2015) [4] studied that the root vegetable Beta vulgaris rubra, (red beetroot) has attracted much attention as a health promoting functional food. The recent interest in beetroot has been primarily driven by the discovery that sources of dietary nitrate may have important implications for managing cardiovascular health. However, beetroot is rich in several other bioactive compounds that may provide health benefits, particularly for disorders characterized by chronic inflammation. Under normal circumstances, however, salivary nitrite is re-absorbed into the circulation via the stomach where it is metabolized to NO and other nitrogen oxides by a variety of reductase enzymes.

4. Summary and conclusion

Beetroot is of exceptional nutritional value; especially the greens, which are rich in calcium, iron and vitamins A and C. Beetroots, are an excellent source of folic acid and a very good source of fibre, manganese and potassium. Per 100 gram serving providing 43 calories, beetroot is an excellent source (20% of the Daily Value, DV) of folate and a good source (14% DV) of manganese, with other nutrients in low amounts (see table displayed at right). The green, leafy portion of the beet is also edible. The young leaves can be added raw to salads, whilst the adult leaves are most commonly served boiled or steamed, in which case they have a taste and texture similar to spinach. Those greens selected should be from bulbs that are unmarked, instead of those with overly limp leaves or wrinkled skins, both of which are signs of dehydration. Other than as a food, beets have use as a food coloring and as a medicinal plant. Many beet products are made from other Beta vulgaris varieties, particularly sugar beet.

The present investigation entitled "standardization and development of beet root based products" was carried out to standardize beetroot and its products with two objectives:-

- To standardize and develop the product using beetroot.
- Organoleptic evaluation of developed products.

The experimental work was carried out in the department of Food & Nutrition, Faculty of Home Science, and KNIPSS Sultanpur. To standardize and develop the beetroot based products required different materials like beetroot halwa and lassi. Dry fruits, salt, oil etc. were used in the experiment would be purchased from the local market of Sultanpur.

In view of the facts regarding nutritional quality of beetroot (ICMR, 2010) was made to develop acceptable beetroot based products. The products were marked as T0 for (controlled) contains no beetroot and T1 (experimental) contains developed and selected beetroot.

5. Conclusion

(a) Experimental (T1) obtained maximum 8.8, 8.3, 8.3 and 8.8 for flavor & taste, body & texture, color &appearance and overall acceptability; while controlled (T0) 7.4, 7, 7.2 and 7.6 obtained for flavor &taste, body & texture, color & appearance and overall acceptability respectively. This indicated that the controlled (To) halwa was found to be fallen under category of "Like Very Much to Like Extremely".

(b) Experimental (T1) 9, 9, 9 and 9 obtained maximum for flavor &taste, body texture, color& appearance and overall acceptability; while controlled (T0) obtained 7.5, 7.7, 7.5 and 7. 6 for flavor &taste, body &texture, color& appearance and overall acceptability respectively. This indicated that the controlled (To) lassi was found to be fallen under category of "Like Very Much to Like Extremely".

The developed products were given to the panel of 10 judges; products were tested for Flavor &taste, body & texture, color & appearance and overall acceptability. The organoleptic evaluation of products was done by using score card method (9-Point Hedonic Scale). The result of beetroot based products for halwa and lassi (T1) were best in all treatments in case of all sensory attributes.

The highest average score for all acceptability was found in experimental products made by developed beetroot based were mostly accepted by panel member.

6. Recommendation

- Development products using beetroot.
- Nutrient analysis of beet root and its products.
- Intervention of beet root based products.

7. Limitations of the study

- The study is carried out for short period so that time and other resource are limited to an extent.
- The sample size of this study was restricted and area of study was limited to KNIPSS, Faculty of Home Science Sultanpur.
- It was a sensory evaluation which has responded information with-out any alternative.

8. Acknowledgement

All glory to the almighty, whose blessing in the success behind this project praise pride and perfection belong to almighty. So first of all I would like to express my deepest sense of gratitude to the omniscient power of the universe, the

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From the very special corner of my heart I wish to record my indebtedness to my advisor for their kind help and express my manifold thanks to Richa Tiwari. I am also thankful to all panel members for giving me proper co-operation during sensory evaluation.
Last but certainly not the least; I dedicate my academic work to my beloved grandfather Late Shri Bharat Prasad Dwivedi who had been my source of inspiration during his lifetime.

9. References

1. Stephen. Colourants. Egan Press. ISBN 1-891127-00-4. 1959. P-ISSN: 2320–1940. 2014; 2(1):09-13.
2. Suganyadevi P, Saravanakumar M, Aravinthan KM, Arunkumar A, Krishna Kavitha R, Karthikeyani S. Extraction of Betacyanin from Red Beet root (Beta vulgaris L.) and to evaluate its antioxidant potential. 2010; 3(11):2693.
3. Sumanasekara. Evaluation of Quality Characteristics of Goat Milk Yogurt Incorporated with Beetroot Juice D.A.P.R. Damunupola*, W.A.D.V. Weerathilake* and G.S. Sumanasekara. 2014; 4(10). 1ISSN 2250-3153 www.ijsrp.org
4. Tom Clifford, Glyn Howatson, Daniel West J, Emma Stevenson J. The Potential Benefits of Red Beetroot Supplementation in Health and Disease. 2015; 7(4):2801-2822. doi:10.3390/nu7042801
5. Viren Ranawana, Vassilios Raikos, Angela mcdonagh, Garry. Processed beetroot (Beta vulgaris L.) As a natural antioxidant in mayonnaise: Effects on physical stability, texture and sensory attributes Duthie, 2016. http://dx.doi.org/10.1016/j.fshw.2016.10.002