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Preparation and Standardization of Millet Flour and Vegetable Juice Incorporated Gavvalu

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Abstract: *Vegetables play an important role in human nutrition. Most are low in fat and calories but are bulky and filling. Beetroots (Beta vulgaris subsp. vulgaris Conditiva Group) are a great source of fiber, folate (vitamin B9), manganese, potassium, iron, and vitamin C, Packed with essential nutrients. Ragi (Eleusine coracana) is rich in fiber minerals and amino acids which make it a good choice for diabetics. It also has more polyphenols than the commonly used grains like rice, wheat, and corn which help control blood sugar levels. Bajra (Pennisetum glaucum) is rich in magnesium, which helps keep the heart healthy. It has potassium, which dilates blood vessels, allowing blood to flow more easily. This helps reduce overall blood pressure. Wheat(Triticum) is filled with a host of nutrients that are great for your health It contains catalytic elements, Vitamin E, Vitamin B, mineral salts, copper, calcium, iodide, magnesium, zinc, potassium, manganese, sulphur, silicon, chlorine, and arsenic, which is why it is a great foundation for any diet. This study investigated the formulation and acceptability of gavvalu incorporated with Millet Flour and Vegetable Juice under three variations, such as 3:1, 2:2 and 1:3 ratio of millet and wheat flour. Present study includes standardization of the cookies, organoleptic evaluation, nutrient and cost calculation of the formulated cookies. Among the variations variation 3 was found to be more acceptable comparatively. The cost of the formulated gavvalu was found to be Rs.23/- for 100g. Formulated gavvalu also had better nutrient content. It can be concluded that Millet Flour and Vegetable Juice Incorporated gavvalu can be prepared with good sensory, nutritional quality and it is also a cost-effective product as a means of nutrient enrichment.*

Keywords: *Beetroots, Ragi, Bajra, Wheat, gavvalu, incorporated gavvalu.*

I. INTRODUCTION

Gavvalu means shells and this sweet is shell shaped traditional sweet made in Andhra Pradesh. These were done basically to make in hygienic conditions, nutritious and economical too. Gavvalu is made of all-purpose flour (maida), ghee and little water fried and mixed in sugar syrup. The composition of the gavvalu varies considerably depends on the method of preparation, type of flour used and efficiency of the sugar syrup. Gavvalu are a sort of candy sweet. It is one of the traditional snacks in India.

Wheat (*Triticum*) is the first important and strategic cereal crop for the majority of world's populations. It is the most important staple food of about two billion people (36% of the world population). Worldwide, wheat provides nearly 55% of the carbohydrates and 20% of the food calories consumed globally (Breiman and Graur, 1995). It is considered good source of protein, minerals, B-group vitamins and dietary fiber. It has several medicinal virtues; starch and gluten in wheat provide heat and energy; the inner bran coats, phosphates and other mineral salts; the outer bran, the much-needed roughage the indigestible portion that helps easy movement of bowels; The wheat germ, which is removed in the process of refining, is also rich in essential vitamin E(: Pawan Kumar-2011).

Ragi (Eleusine coracana), commonly known as finger millet, is widely cultivated millet in the world. It is the sixth grown cereal in India and used as staple food across the country along with central and eastern Africa. In recent decades, ragi has been in focus due to its nutritional strength and high amount of dietary fiber (e.g. Water soluble fibers like arabinoxylans while water insoluble fibers like lignin, cellulose, hemi-cellulose) and minerals (calcium, phosphorous and iron) (Kudake et al-2018). The calcium content is higher than all cereals and iodine content is said to be highest among all the food grains. Ragi has best quality protein along with the presence of essential amino acids, vitamin A, vitamin B and phosphorus (Gopalan et al., 2004). It contains about 5–8% protein, 1–2% ether extractives, 65–75% carbohydrates, 15–20% dietary fibre and 2.5–3.5% minerals (Chethan and Malleshi 2007).

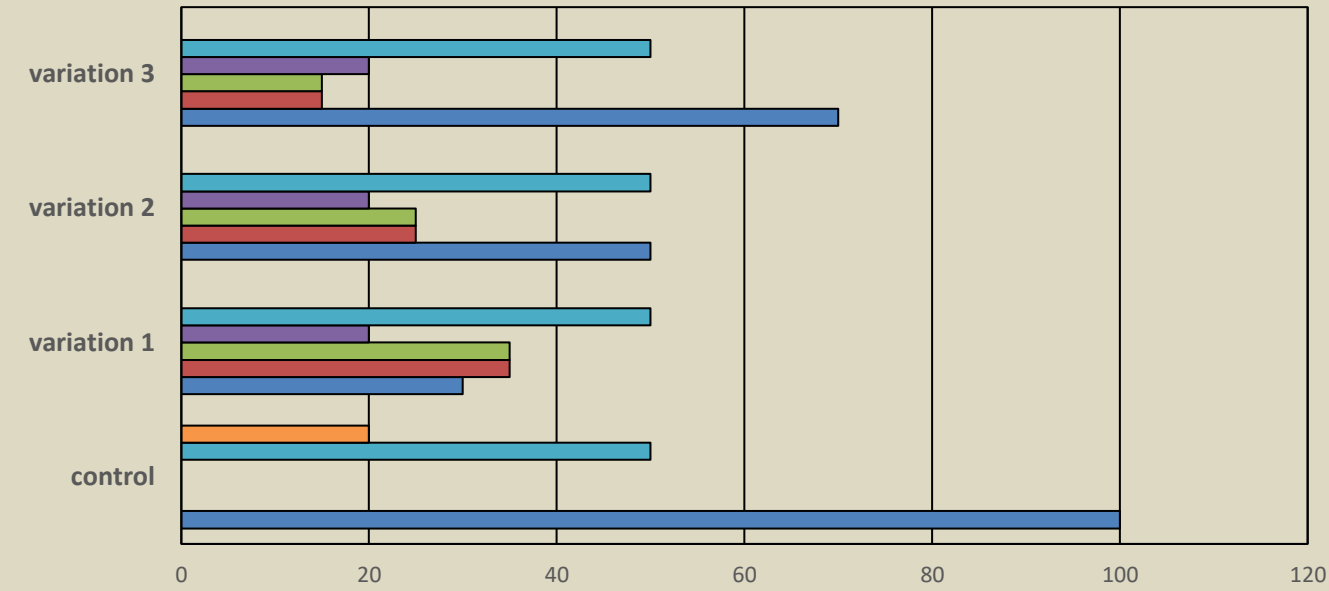
Bajra is the most widely grown type of millet. It has been grown in Africa and the Indian subcontinent since prehistoric times. bajra has energy, protein, fat, mineral, fibre, carbohydrate, Calcium, phosphorus and iron .

Beetroot (Beta vulgaris L.) belongs to family Chenopodiaceae and was originated in Asia and Europe(Chawla, Parle, Sharma & Yadav, 2016).Beetroot is a root vegetable with carotenoids, nitrates, flavonoids, vitamins, minerals such as potassium, sodium, phosphorous, calcium, magnesium, copper, iron, zinc, manganese and water soluble pigments betalains like betacyanins (red-violet color) and betaxanthins (yellow orange color), all of which have numerous nutritional and health benefits (Panghal, Virkar, et al., 2017).

II. MATERIALS AND METHODS

The raw materials for the preparation of Millet Flour and Vegetable Juice Incorporated Gavvalu was purchased from the local departmental store.

Graph I - Ratio between control samples, variation 1, variation 2, variation 3.



	control	variation 1	variation 2	variation 3
water(ml)	20	0	0	0
sugar(g)	50	50	50	50
betroot(ml)	0	20	20	20
bajra flour(g)	0	35	25	15
ragi flour(g)	0	35	25	15
wheat flour(g)	100	30	50	70

For the Preparation of Control sample 100g of wheat flour, 20ml of hot water was mixed together to form firm dough and kept it for rest for 20 minutes. The dough was separated into small pieces, and make into desire shape by dough shaper. The shaped dough are fried in the oil and the coated with the prepared warm sugar syrup with 50g of sugar then stored in the air tight container.

For the preparation of Variation 1 30g of wheat flour, 35g of ragi flour, 35g of bajra flour, 20ml of beetroot extract was mixed together to form firm dough and kept it for rest for 20 minutes. The dough was separated into small pieces, and make into desire shape by dough shaper. The shaped dough are fried in the oil and the coated with the prepared warm sugar syrup with 50g of sugar then stored in the air tight container.

For the preparation of Variation 2 50g of wheat flour, 25g of ragi flour, 25g of bajra flour, 20ml of beetroot extract was mixed together to form firm dough and kept it for rest for 20 minutes. The dough was separated into small pieces, and make into desire shape by dough shaper. The shaped dough are fried in the oil and the coated with the prepared warm sugar syrup with 50g of sugar then stored in the air tight container.

For the preparation of Variation 3 70g of wheat flour, 15g of ragi flour, 15g of bajra flour, 20ml of beetroot extract was mixed together to form firm dough and kept it for rest for 20 minutes. The dough was separated into small pieces, and make into desire shape by dough shaper. The shaped dough are fried in the oil and the coated with the prepared warm sugar syrup with 50g of sugar then stored in the air tight container.

III. RESULT

3.1. SENSORY EVALUATION FOR THE STANDARDIZATION OF INCORPORATED GAVVALU

Sensory evaluation can be defined as a scientific discipline that applies principles of experimental design and statistical analyses of the human senses (sight, smell, taste, texture) for the purpose of evaluating consumer products. The sensory evaluation was done by a selected panel of 10 semi- trained members on a nine point hedonic scale for the acceptability of the product. The Standardized Millet Flour and Vegetable Juice Incorporated Gavvalu was evaluated for its acceptability by sensory qualities using panel of 10 members by administering a score card consisting of five characteristics like colour and appearance, flavour, texture, taste and overall acceptability.

The data in the table indicates the variation 3 is highly acceptable in all sensory qualities except colour and appearance. The proportion of the ingredients used in variation 3 is presented in the table I. On comparing with the commercial sweet shell in market, the Millet Flour and Vegetable Juice Incorporated Gavvalu prepared by us was highly acceptable on the basis of all Sensory Characteristics.

Table I: Average Sensory scores of Millet Flour and Vegetable Juice Incorporated Gavvalu

Criteria	Control	Variation 1	Variation 2	Variation 3
Color and appearance	8.5	9	9	8.9
Texture	7.8	7.8	7.4	8.2
Taste	7.8	8	7.8	8.5
Flavor	8.2	7.3	7.9	8.7
Overall acceptability	7.5	7.6	7.3	8

3.2 NUTRITIONAL VALUE FOR SELECTED MILLET FLOUR AND VEGETABLE JUICE INCORPORATED GAVVALU

The calculated nutrient content of the selected Millet Flour and Vegetable Juice Incorporated Gavvalu were given in the table II

Table II- Nutritive value per 100g of the selected Millet Flour and Vegetable Juice Incorporated Gavvalu

Nutrient	**Quantity (per 100g)**
Energy	541.3 kcal
Carbohydrate	118.6 g
Fat	5.9 g
Protein	11.6 g
Iron	45.3 g
Calcium	103.82 g

3.3 COST CALCULATION

Cost calculation was made to find the price of the product for selling . This may help to know the loss and profit that get. Cost of development of Millet Flour and Vegetable Juice Incorporated Gavvalu has been calculated by using a standard price list from the local market where the ingredients were purchased

Table III Cost Calculation for the selected product

S .no	Ingredients	Cost per kg / liter(Rs)	Quantity of the ingredients	Cost (Rs)
01	Wheat flour	57	70g	3.9
02	Ragi flour	60	15g	1
03	Bajra flour	60	15g	1
04	Beetroot	30	5g	0.1
05	Sugar	40	50g	2
06	Processing cost			10
07	Net profit (20%)			5
08	Total			23

IV. DISCUSSION

Among the formulated millet flour and vegetable juice incorporated gavvalu- variation 3 was highly acceptable of its good sensory scores given by the panel members and also contain more nutrient content.so it is a product that is nutritious with an affordable price.

V. CONCLUSION

Standardization And Preparation Of Millet Flour And Vegetable Juice Incorporated Gavvalu was to increase the nutritive value of gavvalu .the Sensory evaluation of the Prepared Millet Flour And Vegetable Juice Incorporated Gavvalu of variation 1 with 1:3 ratio of wheat flour and millet flour, variation 2 with 2:2 ratio of wheat flour and millet flour and variation 3 with 3:1 ratio of wheat flour and millet flour was conducted with more than 10 people for the consumer acceptability of the product. On Comparison with Commercial sweet shells which is available in market on the cost and the nutritive value of the standardized Millet Flour and Vegetable Juice Incorporated Gavvalu has more health benefits at affordable cost. Millet Flour and Vegetable Juice Incorporated Gavvalu was highly acceptable based on all characteristics as it was more nutritious and appetizing. It is concluded that the variation 3 has improved the Overall Quality with Specifically Reference to Color Analysis and Sensory Evaluation. The main aim of the study is to Standardization and Preparation of Millet Flour and Vegetable Juice Incorporated Gavvalu and evaluate the quality attributes. The quality parameters of Gavvalu meet the standards. The shelf- life of the product was extends to 100 days under processed and tetra- packaging in room temperature. The present study indicates that a good quality value added products from millet flour**.**

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