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NOODLES MADE FROM BLACK RICE: A STUDY OF THEIR PREPARATION AND EVALUATION

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ABSTRACT

Since ancient times, Asian populations have eaten noodles as a staple cuisine. It is a tasty, convenient, simple to prepare, and nutritious product that is now well-liked outside of Asia. The most common ingredients used to make rice noodles are flour, salt, water, and a few extras. In the presence of water and salt, rice flour is needed to create dough, which is then sheeted, compounded, steamed, and sliced to create noodles. The strands of noodles can be further processed (dried, fried, boiled) to create different varieties of noodles based on consumer preferences. Rice noodles don't contain gluten, hence its texture is less expansive and cohesive. Rice starches are partially gelatinized by steaming, which helps rice-based noodles somewhat compensate for the role of gluten.

Keywords: Raw Resources; Processing; Qualities Of Rice Noodles, Flour, Black Rice.

I. INTRODUCTION

Black rice is the native of the common rice variety (Oryza Sativa) it is used as functional food due to the effectiveness to health. Black rice is a rich source of Iron, Antioxidant including phenolic compounds which prevent illness and it is used for hospitalized patient. Noodles are made from simple ingredients including rice flour, salt, water it is the most popular food consumed throughout the world. Noodles are favored by consumers for ease of cooking, handling, tranportations and their cost is affordable. In this study black rice bran was selected because of its high nutritional value and distribution of antioxidant compounds. Anthocyanins are the most commonly found in black rice which gives purple colour to the pericarp layer. Generally rice noodles are made from flour containing high amylose concentration (>21%), which contributes to the gel network. It provides firm structure and desirable properties to noodle. Noodles are a wholesome dish that complies with international food safety regulations. Consumer demand for high-quality noodle products rises along with the growth of the Asia-Pacific economy. Next to cooked rice grain, rice noodles are the rice product that is most popular in Asia. Noodles can either be served as a soup noodle by boiling in broth or by frying and mixed with meats and veggies. Since rice proteins don't include gluten, they can't make continuous visco elastic dough. Therefore, pre-gelatinized rice flour is used to bond the remaining flour. The degree of pre-gelatinization is crucial in giving the strands of the noodles a desirable texture. Most often, rice During the extrusion process, the level of gelatinization is appropriately managed to build the desired binding power, while excessive gelatinization may cause handling issues. The two major methods for making rice noodles are sheeting the dough to create flat noodles and extruding the dough to create vermicelli. Typically, the functions, procedures, and desired end product of the raw ingredients for rice-based noodles are assessed. The pasting and physicochemical properties of rice flour made from various types of rice determine its textural, culinary, and sensory qualities.

The characteristics of noodles can also be influenced by the size of the flour particles. Noodles prepared from flour with reduced particle size, however, displayed excellent textural qualities. Similar to the larger particle size, the smaller particle size had the lowest gelatinization temperature but the highest water absorption index, hot paste viscosity, peak viscosity, and breakdown. However, the amount of fat present has no impact on the characteristics of the noodles.

Nutritional Composition -

75% of black rice is Carbohydrate, especially starch. It is also rich source of a class of dietary fibre resistant starch. Cellulose, hemicellulose and pectin and simple sugar(glucose, fructose).Black rice has more minerals

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such as Iron Calcium, Zinc, Copper, Magnesium, Potassium than refined white rice. Black rice has more nutritional attributes than white rice due to Vitamin A, E, B.

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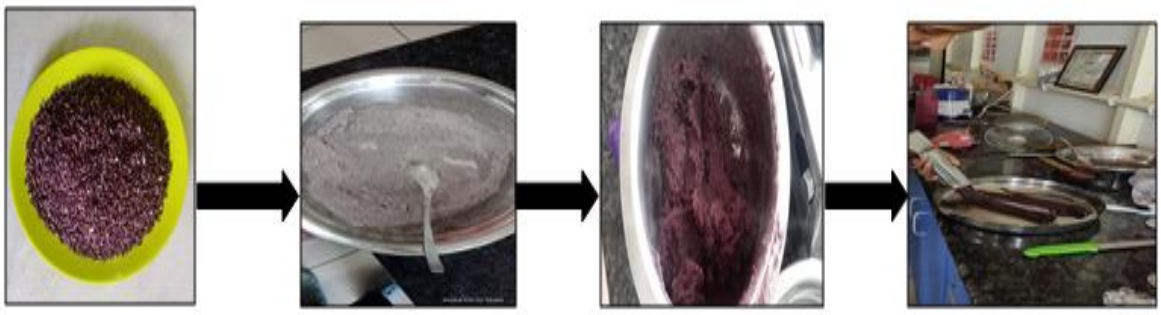
II. MATERIAL AND METHODS

Along with finishing all of the studies, the preparation of black rice noodles was done in the Food Science & Technology lab at the Babasaheb Bhimrao Ambedkar University's School of Home Science's Department of Food and Nutrition.

Materials-

Black rice is purplish colour rice mostly grown in North East (Assam). Black rice flour used to make noodles it gives fine colour and texture also. The main ingredients are Rice flour, Salt, arrow root flour, water and refined oil.

1. Flow chart of black rice noodles



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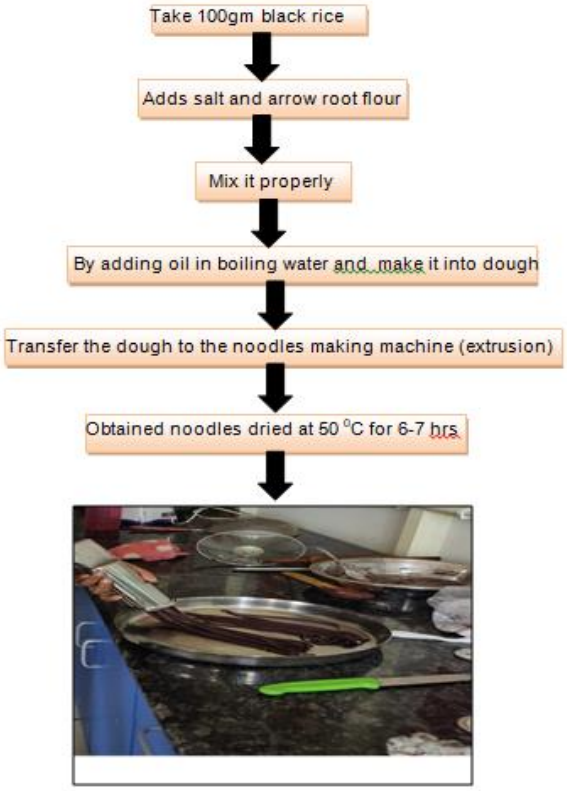
Noodles Preparation



Preparation of black rice flour-

Take rice, beat it, remove dirt from it, then put it in a grinder and make a mixture or flour.

Preparation of black rice noodles-

The basic step of noodles making is dough blending .For uniform blending ,the respectively flour blends were mixed in a planetary mixture for 5 -8 minutes. For the preparation of noodles ,rice flour blends (100g), all other ingredients are based on the amount of flour, salt 2% ,black pepper 1%, water 20 -22% were mixed at planetary mixture for 8-10 mins at 60 rpm. The result dough was covered with moist cloth and rested for 15 min to proper hydration .It was then pass through extruder equipped with a 1. 5 mm diameter to obtain noodles strands about 10 cm. The fresh noodles were steamed for 10 min in a steamer. Finally the noodles are dried for 6 hours under sun. The cooled noodles packed in polythene bags of 100g instant noodles then keep it a room temperature at -18 degree ^{0}C for further analysis.

Consumer acceptability and the standard sensory evaluation -

The 9 hedonic scale test is used for the sensory evaluation. The overall taste, appearance, texture, flavour, consumer acceptability. The 9 hedonic scales reflects the consumer acceptability and the perspective and satisfaction. 25 students who are studied in our University evaluated the noodles acceptability, colour, taste, aroma, texture etc. through rating the black rice noodles in a hedonic scorecard given in the table.

Table: 1. Hedonic Scale

Rating Scale/Hedonic Scale	Score
Like extremely	9
Like very much	8
Like Moderately	7
Like Slightly	6
Neither Like nor dislike	5
Dislike Slightly	4

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Dislike Moderately	3
Dislike very much	2
Dislike extremely	1

III. RESULT AND DISCUSSION

25 people from our university were selected for sensory evaluation and presented with black rice noodles sample. Sample were distributed to people and sensory evaluation for taste, smell, taste, shape and texture were done.

Table: 2. Sensory Score Of Black Rice Noodles Overall Acceptance

Panelist	Appearance/ colour	Taste / flavor	Smell/odour	Texture/ mouth feel
P1	9	8	8	7
P2	9	9	9	9
P3	9	9	9	6
P4	9	9	9	7
P5	9	9	8	8
P6	8	8	9	9
P7	9	9	9	9
P8	9	9	9	7
P9	8	8	9	7
P10	9	8	7	8
P11	9	7	8	9
P13	8	9	7	8
P14	8	9	7	6
P15	7	8	6	8
P16	8	9	9	6
P17	9	9	9	9
P18	8	9	8	7
P19	9	8	8	8
P20	9	7	7	8
P21	8	7	8	8
P22	9	9	9	8
P23	9	9	9	9
P24	9	9	7	9
P25	9	8	6	8
Total	207	203	194	188
MEAN	16.56	16.24	15.52	15.04
SD	0.575779245	0.721060009	1.017954755	1.00722031
PERCENTAGE	36.0	32.0	32.0	28.0

GRAPHICAL REPRENSTATION OF OVERALL ACCEPTANCE

When the black rice noodles sample was prepared, the sensory evaluation took place 6-7 hours sun dried. 25 untrained students from Babasaheb Bhimrao Ambedker University Lucknow composed the sensory panel. Black rice noodles was evaluated on a 9-point hedonic scale for flavor, scent, texture, appearance, and over all acceptances. Since the 9-point hedonic scale demonstrates and explained the level of consumer acceptability and pleasure. The hedonic rating card that is displayed in the table was handed to them.

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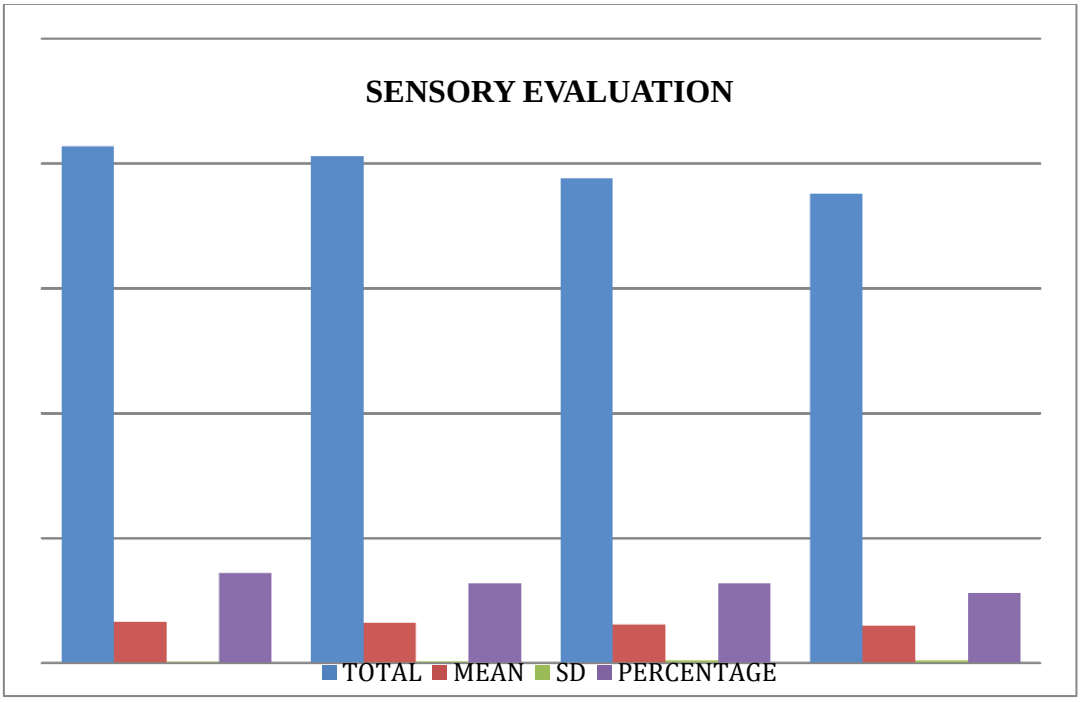
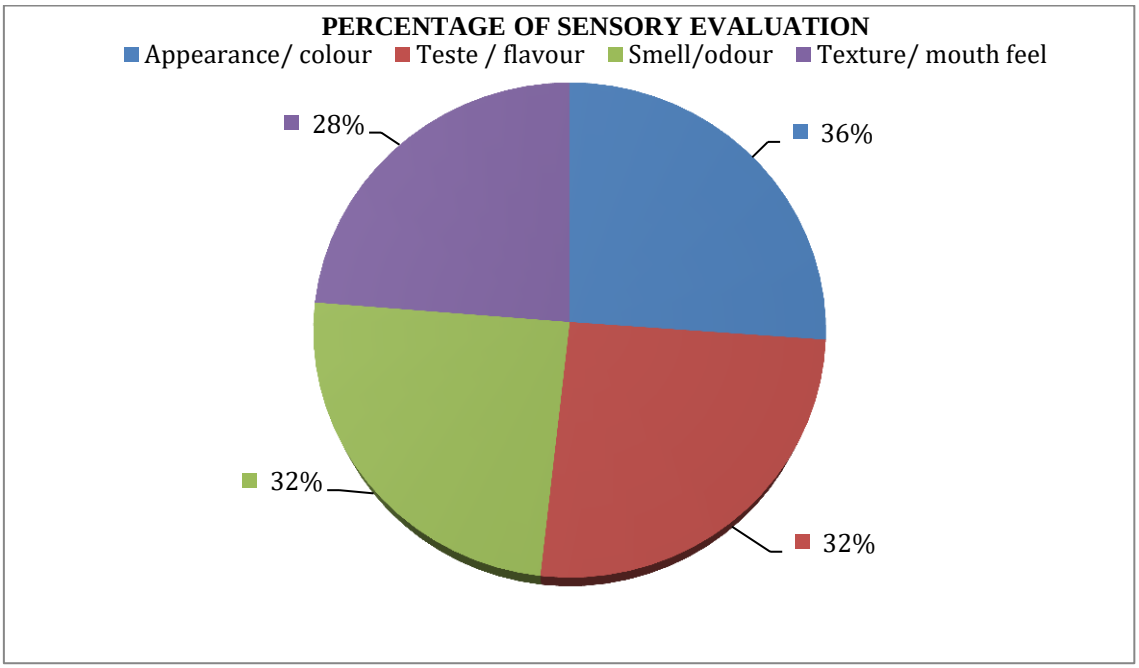


PIE CHART OF OVERALL ACCEPTANCE OF PERCENTAGE



IV. CONCLUSION

Gluten-free noodles have become more popular recently because of their positive effects on health. It lessens allergic reactions and celiac disease in individuals who have these conditions due to consuming wheat-based goods. Rice noodles are prepared using three basic ingredients: flour, water, and salts. The fundamental steps in making rice noodles are mixing the dough, producing sheets, compounding, sheeting/reduction, steaming, and cutting. Variations in flour characteristics and processing techniques have a big impact on the final noodle quality. Rice flour with the right amount of protein, amylose, and less ash is used to make rice-based noodles. The functional, thermal, pasting, cooking, eating, and sensory qualities of rice noodles are influenced by compositional variations and reduced starch concentration. The hardness and brightness of the noodle strands are positively correlated with protein concentration and amylose concentration. An increased starch content results in significant surface swelling and cooking loss.

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V. REFERENCE

[1] Kong, S., Kim, D. J., Oh, S. K., Choi, I. S., Jeong, H. S., & Lee, J. (2012). Black rice bran as an ingredient in noodles: chemical and functional evaluation. Journal of Food Science, 77(3), C303-C307.

[2] Ahmed, I., Qazi, I. M., Li, Z., & Ullah, J. (2016). Rice Noodles: Materials, Processing and Quality Evaluation: Rice Noodles: Materials, Processing and Quality Evaluation. Proceedings of the Pakistan Academy of Sciences: B. Life and Environmental Sciences, 53(3), 215-238.

[3] Fatchiyah, F., Sari, D. R. T., Safitri, A., & Cairns, J. R. (2020). Phytochemical compound and nutritional value in black rice from Java Island, Indonesia. Sys Rev Pharm, 11(7), 414-421.

[4] Bedier, D. F., Salem, R. H., Almashad, A. A., & Barakat, E. H. (2020). Quality Characteristics Of Noodles Containing Various Levels of Black Rice Flour. Journal of Food and Dairy Sciences, 11(5), 141-146.

[5] Ito, V. C., & Lacerda, L. G. (2019). Black rice (Oryza sativa L.): A review of its historical aspects, chemical composition, nutritional and functional properties, and applications and processing technologies. Food chemistry, 301, 125304.

[6] Jin, F., Niu, L., Tu, J., & Xiao, J. (2022). Effect of different starches on edible quality, in vitro starch digestibility, and antioxidant property of black rice noodle. Starch-Stärke, 74(3-4), 2100168.

[7] Cahyaningrum, N., Fajri, M., Indrasari, S. D., & Purwaningsih, H. (2021). The Effect of Dryer Type on Consumer Acceptance of Brown and Black Rice Sembada Varieties of Noodles. In E3S Web of Conferences (Vol. 316, p. 03016). EDP Sciences.