

Development of Fibre Enriched Pasta from Brown Top Millet

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Abstract:- I recently came across some interesting information about the growing popularity of millets among millennials. Brown top millets, in particular, have gained attention for their gluten-free, nutrient-dense properties and are cultivated in dry regions of India and other parts of the world. Similarly, Rajma, a crop that originated in the Indian subcontinent, is grown for food production and as a forage and cover crop. It is an excellent source of protein and is used in various food products for its therapeutic benefits. To combat nutrient-deficient diets and malnutrition, Fibre Enriched Brown Top Millet Pasta (FBTP) was developed by incorporating Brown top Millet (40%, 60%, and 80%), rajmah pulses flour (40%, 60% and 100%) grape skin powder (10% and 20%). The FBTP had a higher amount of antioxidant capacity and improved functional and nutraceutical properties. Overall, this presents a great opportunity for utilizing these crops in food products and reaping their many benefits.

I. INTRODUCTION

The article discusses the health benefits of millets and rajma and their potential utilization in food products as a therapeutic agent. The Fiber Enriched Brown Top Millet Pasta (FBTP), made with brown top millet flour, rajmah pulses flour, and grape skin powder, is a promising innovation to combat nutrient-deficient diets and malnutrition. The pasta is rich in antioxidants and nutraceuticals, making it a healthier food option. The article emphasizes the importance of increasing the consumption of fiber-rich foods containing both soluble and insoluble fibers, such as whole grains, legumes, fruits, and vegetables, for promoting health and well-being. The incorporation of nutritious ingredients into pasta offers consumers a delicious and nutritious choice for their meals, contributing to overall health and sustainability.

I recently came across some interesting information about millets and rajma. Apparently, millets have gained popularity among millennials due to their therapeutic benefits

and nutrient density. Brown top millets, in particular, are grown in dry regions of India and have a unique ability to grow on hard soil with very little water. On the other hand, rajma is a crop that is grown for food production and as a forage and cover crop. It is widely cultivated in India, Brazil, China, and several other countries. Both these crops have excellent health benefits and are used as sources of food, feed, fodder, green manuring, and green pasture.

It is fascinating to note that Fibre Enriched Brown Top Millet Pasta (FBTP) is a great way to combat nutrient-deficient diets and malnutrition. The pasta is made with brown top millet flour, rajmah pulses flour, and grape skin powder, which makes it rich in antioxidants and nutraceuticals. The results of the investigation showed that Fiber Enriched Brown Top Millet Pasta was acceptable, with improved functional and nutraceutical properties. I think this is an excellent opportunity to utilize these crops in food products as a therapeutic agent and promote healthier eating habits.

II. MATERIALS AND METHODS

The raw materials such as Brown top millet, Rajmah pulses, Grape skin Powder was procured from the local market.

➤ *Methodology for the Preparation of Fiber Enriched Brown Top Millet Pasta*

- Procurement of Millet from Online shoppes and Pulses and Grapes from local market
- Collected samples cleaning and washing
- Drying millet, pulses and Grape skin [Hot air oven drying at 80 C for 7 hours]
- Grind into powder [millet, pulses, grape skin]
- Make a dough [incorporated with millet, pulses, and grape skin and wheat powder]
- Shape the pasta and let the pasta dry

III. RESULTS AND DISCUSSION

➤ Sensory Evaluation
Sensory Analysis of the Fiber Enriched Brown Top Millet Pasta (FBTP)

Table 1 Sensory Evaluation

Panel member	Colour			Texture			Appearance			Flavour			Taste			Overall Acceptability		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
1	7	8	8	6	8	7	7	7	7	7	8	7	7	8	7	7	8	7
2	6	7	7	5	7	6	7	8	7	8	8	7	6	7	7	7	7	7
3	7	8	7	5	7	6	7	7	6	7	7	6	6	7	8	7	8	7
4	7	9	8	6	8	7	7	7	7	8	8	7	6	8	7	8	8	7
5	7	8	7	6	7	6	7	8	7	7	7	6	7	8	7	7	7	7
6	6	7	7	7	8	6	8	8	7	6	9	7	7	7	6	7	8	8
7	8	7	7	6	7	7	7	7	8	7	8	6	8	7	6	7	8	6
8	6	8	7	7	7	7	6	8	7	8	7	6	7	6	6	7	7	7
9	7	7	6	6	8	8	6	8	6	7	7	6	6	8	7	6	7	6
10	6	7	6	7	7	8	7	7	6	7	7	7	7	8	7	6	7	7
11	7	7	6	6	7	7	8	7	7	6	8	7	8	7	8	8	8	7
12	7	8	7	6	7	6	7	6	8	7	6	7	8	8	7	7	7	6
13	6	7	6	7	8	6	7	7	7	6	7	6	7	7	7	7	8	6
14	6	9	7	6	8	7	8	8	8	7	8	7	6	9	7	7	9	8
15	6	8	7	6	7	6	7	8	7	7	8	7	7	8	7	7	8	8
MEAN	6.6	7.6	6.8	6.1	7.4	6.6	7.4	7.4	7.4	7.4	7.5	6.6	6.8	7.5	6.9	7.6	7.6	6.9

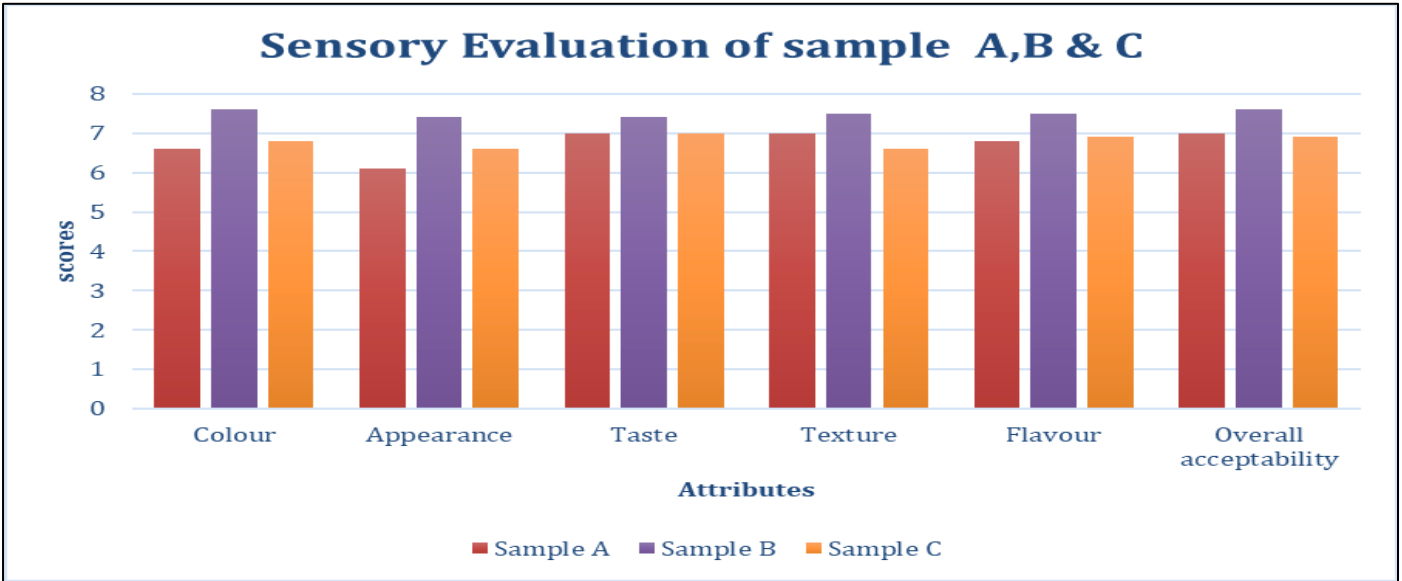


Fig 1 Sensory Evaluation

Sensory analysis results show that the mean scores of sensory evaluations of pasta made with adding onion, tomato, chili powder and garam masala with required amount of salt as flavoring in the range of liked moderately to liked very much in attributes like color, appearance, flavor, texture, taste, and overall acceptability.

➤ *Estimation of Carbohydrates*

Table 2 Estimation of Carbohydrates

Pasta	Carbohydrate (g/100g)
Fiber Enriched Brown Top Millet Pasta (FBTP)	66.6g

The carbohydrate present in Fiber Enriched Brown Top Millet Pasta (FBTP) is 66.6g. The carbohydrate profile includes the analysis of starch, amylose, amylopectin, resistant starch, total dietary fiber, soluble dietary fiber, insoluble dietary fiber, total sugars, reducing sugars and non-reducing sugars. The brown top millet had a total starch

content of 56.43 g/100g out of which amylose and amylopectin were 14.16 and 42.25 g/100 g respectively (Verma et al., 2018).

➤ *Estimation of Protein*

Table 3 Estimation of Protein

Pasta	Protein (g/100g)
Fiber Enriched Brown Top Millet Pasta (FBTP)	25g

The total protein content in Fiber Enriched Brown Top Millet Pasta (FBTP) is 25g. The enriching components added in pasta dough were found to have a positive effect on pasta quality. These increased protein content by 1.59-8.19%, biological value by 6-16%, utility coefficient of amino acid composition by 0.2-0.26, protein digestibility by pepsin by 11-24%, and daily protein intake level by 31.4-12.5% (Osipova Galina, et al., 2019).



Fig 2 Protein Carbohydrate

Protein and Carbohydrates content of the Fiber Enriched Brown Top Millet Pasta.

➤ *Estimation of Moisture*

Table 4 Estimation of Moisture

Pasta	Moisture (Percent)
Fiber Enriched Brown Top Millet Pasta	4%

Moisture content of Fiber Enriched Brown Top Millet Pasta (FBTP) is 4%.

Representative single-reflection ATR and NIR spectra obtained for the analyzed samples collected at different stages

of the production process: after kneading the dough in the pre-mixer (30% moisture), after forming the pasta (22% moisture) and at the end of drying process (9% moisture) are presented (Tomasz Czaja, et al., 2018).

➤ *Estimation of Ash*

Table 5 Estimation of Ash

PASTA	Ash (Percent)
Fiber Enriched Brown Top Millet Pasta	1.8%

Ash content of Fiber Enriched Brown Top Millet Pasta (FBTP) is 1.8%.

Pasta red index was found to increase linearly ($r = 0.95$, $p < 0.001$) with the ash content. Pasta red index is generally

associated to Maillard reactions which occur between amino acids and reducing sugars during drying (Anese et al., 1999).

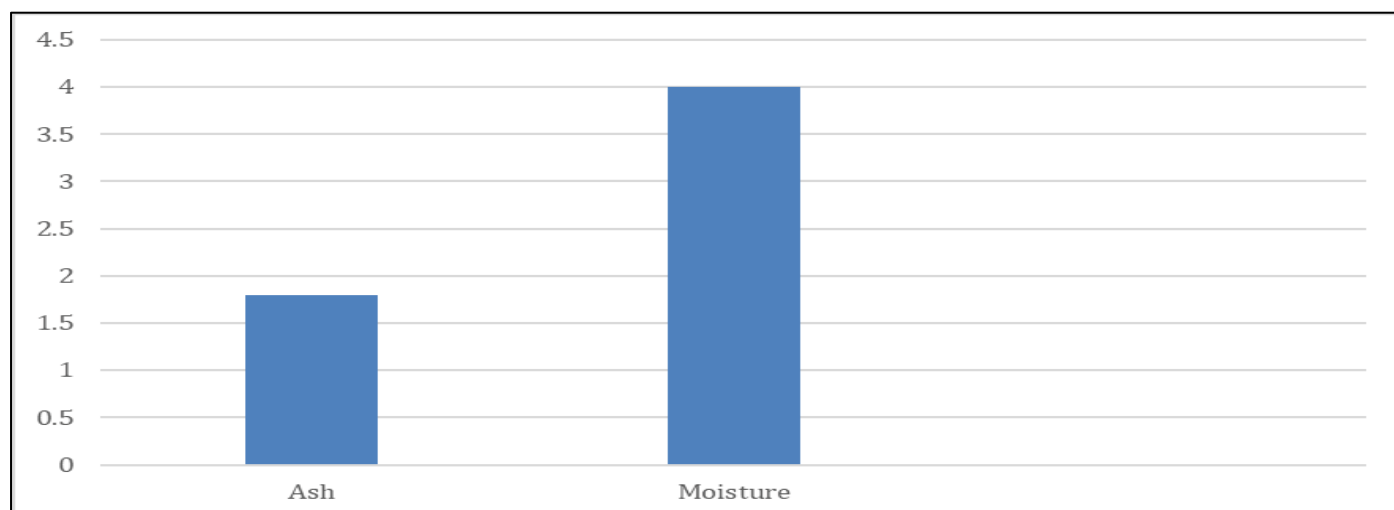


Fig 3 Pasta red Index was Found to Increase Linearly

Ash and Moisture content of the Fiber Enriched Brown Top Millet Pasta (FBTP)

IV. CONCLUSION

In conclusion, the development of fiber-enriched pasta from brown top millet presents a promising avenue for promoting health and sustainability in the food industry. By harnessing the nutritional benefits of millet, this innovation addresses the growing demand for healthier food options while also supporting sustainable agriculture practices. Further research and development in this area could lead to the commercialization of fiber-enriched pasta, offering consumers a delicious and nutritious choice for their meals. Millet and pulses are excellent sources of dietary fiber, which aids digestion and promotes gut health. Pulses are high in protein, making this pasta an ideal option for vegetarians and vegans looking to increase their protein intake. Grape skin contains antioxidants such as resveratrol, which may have numerous health benefits, including reducing inflammation and lowering the risk of chronic diseases. By incorporating these ingredients into pasta, consumers can enjoy a meal that is not only delicious but also packed with essential nutrients, contributing to overall health and well-being.

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