

Development and Evaluation of Whole Wheat Banana Blueberry Buttermilk Bread

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ABSTRACT

The study was undertaken to check the various parameter tests of sensory evaluation, antioxidant activity, microbial analysis, proximate analysis and cost analysis of Whole Wheat Banana Blueberry Buttermilk Bread. The test of parameters was done of prepared whole wheat bread after it was made and cooled. The present study is based upon the determining and collection of sensory evaluation, antioxidant activity, proximate analysis and microbial analysis of various parameters. Banana is the oldest and commonest fruit known to mankind. It is cultivated primarily for food and secondarily for fiber used in the textile industry. Bananas are nutritious fruits in terms of their carbohydrate and sugar content. Blueberries can help heart health, blood pressure, diabetes management, cancer prevention and mental health. Flavonoids are plant compounds that often have a powerful antioxidant effect. Blueberry is a rich source of Vitamins, Antioxidant, Antimicrobial and it also has anticancer properties. This Whole Wheat Banana Blueberry Buttermilk Bread is a healthy food to consume because no preservatives are added to it. 3 types of Whole Wheat Bread were made. A was Whole Wheat Bread with Banana, Blueberry Buttermilk and honey, B was Whole Wheat Bread with Banana, Blueberry, Buttermilk, 1 tsp stevia, C was Whole Wheat Bread with Banana, Blueberry, Buttermilk and 2 tsp stevia. Sensory Evaluation of Whole Wheat Banana Blueberry Buttermilk Bread was carried out for attributes such as flavour, texture, taste and overall acceptability. Results of sensory evaluation show that sample B is most acceptable.

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KEYWORDS: *Banana, Blueberry, Bread, Banana Bread, Antidiabetic, Antioxidant rich*

1. INTRODUCTION

Maybe you've been led to believe that eating bread is bad for you. You can blame the increasing popularity of low-carb diets, which tell you to significantly cut your carbs and as a result, significantly cuts your calories. Sure, eating anything in excess will cause you to gain weight. But having a healthy amount of whole wheat bread in your diet can actually benefit you in many ways, even in some ways you've never even realised. The latest nutrition science shows us that having whole grains in our diets like whole wheat bread will garner a few positive effects on our overall health.

Although some of whole wheat breads include a long list of chemicals and preservatives and even high amount of added sugars, there are other types of bread on the shelves that can still benefit your diet in many ways. The best type to go for is whole wheat bread

that include whole grains and even fruits in it, which still have all those good-for-you nutrients in every slice. We are talking here about a Whole wheat banana blueberry buttermilk bread. Bananas contain a fair amount of fiber as well as several antioxidants. One medium sized banana (118 grams) also boasts Potassium, Vitamin B6, Vitamin C, Copper, Magnesium, Manganese, Net carbs, Protein, Fat.

Banana contain nutrients that moderate Blood Sugar Levels. They May Improve Digestive Health Dietary fiber has been linked to many health benefits, including improved Digestion. Bananas contain two main types of fiber: 1.Pectin: Decreases as the banana ripens. 2. Resistant starch: Found in unripe banana. They Contain Powerful Antioxidants (including dopamine and catechins) Unripe Bananas May Improve Insulin Sensitivity (helps in diabetes).

Bananas May Improve Kidney Health. Manganese in bananas is good for your skin. One medium-sized banana provides approximately 13% of your daily manganese needs. Manganese helps your body make collagen and protects your skin and other cells against free radical damage.

Bananas are nutritious fruit in terms of their carbohydrate and sugar contents. Ripe fruit contains as much as 22% of carbohydrate, mainly as sugar, and is high in dietary fiber, potassium, manganese, and vitamins B6 and C. Almost all the modern edible parthenocarpic bananas come from the two wild species-*M. acuminata* and *M. balbisiana*. Other than fresh fruits, they can be consumed as processed in various forms like chips, powder, flakes, etc.

Blueberries are beneficial in various methods like maintaining healthy bones because it has calcium, iron, and phosphorus. Maintaining skin health because it has collagen. It helps in lowering blood pressure because it has free form sodium in it. One cup of blueberries provides 24 percent of a person recommended daily allowance of vitamin C. Use blueberries to top waffles, pancakes, yogurt, oatmeal, or cereal, blend them in a smoothie or syrup, or fold them into muffins and sweet breads. People who use blood-thinners, such as warfarin, should speak to their doctor before increasing their intake of blueberries, as the high vitamin K content can affect blood clotting.

Blueberry also protects against heart disease because there is no cholesterol in it. It also prevents cancer because antioxidants present in it inhibit the growth of tumour and decreases inflammation. It also helps in improving mental health by reducing the risk of cognitive damage. Blueberries are helpful in weight loss, healthy digestion and also prevents constipation. The effects on sensory, antioxidant, proximate and microbial analysis of whole wheat banana blueberry buttermilk bread were also studied.

2. Material and Methodology:

2.1. Raw materials.

1. Whole wheat flour
2. Ripe bananas and blueberries

3. Buttermilk
4. Vinegar & baking soda (egg substitute)
5. Vanilla extract
6. Stevia (plant sugar)
7. Coconut oil /unsalted butter
8. Salt
9. Baking powder
10. Nondairy yogurt

2.2. Preparation of Bread.

3 types of Whole Wheat Bread were made. A was Whole Wheat Bread with Banana, Blueberry Buttermilk and honey, B was Whole Wheat Bread with Banana, Blueberry, Buttermilk, 1 tsp stevia, C was Whole Wheat Bread with Banana, Blueberry, Buttermilk and 2 tsp stevia.

Take all the dry ingredients like whole wheat flour, stevia, baking powder and combine them in a bowl.

In a separate bowl combine vinegar and baking soda(egg substitute), vanilla essence and coconut oil and whisk them in till it's combined perfectly with no lumps. Now add in nondairy yogurt and whisk again till smooth mixture is formed. Add the mashed banana and incorporate it in the mixture.

Once the batter is smooth enough slowly add the dry ingredients. Now combine the dry ingredients in the wet ingredients slowly while making sure there are no lumps present. Use buttermilk as and when required (for best results add the dry ingredients in 3 parts). Now once the wet and dry ingredients are combined. Slowly fold the washed blueberries in the batter (some cut and some whole). Now grease the bowl with coconut oil or unsalted butter and pour the batter in it and bake in a preheated oven for 30 to 40 minutes.

Once the bread is baked check it by inserting the toothpick in the centre of it. If it comes out clean the bread is ready. Now take the bread out of the oven and let it cool down for a couple of minutes and then cut and serve fresh with the choice of dip (yogurt, peanut butter, icecream, nutella etc). All the breads were used for sensory evaluation and the best one selected was sent for nutritional testing.

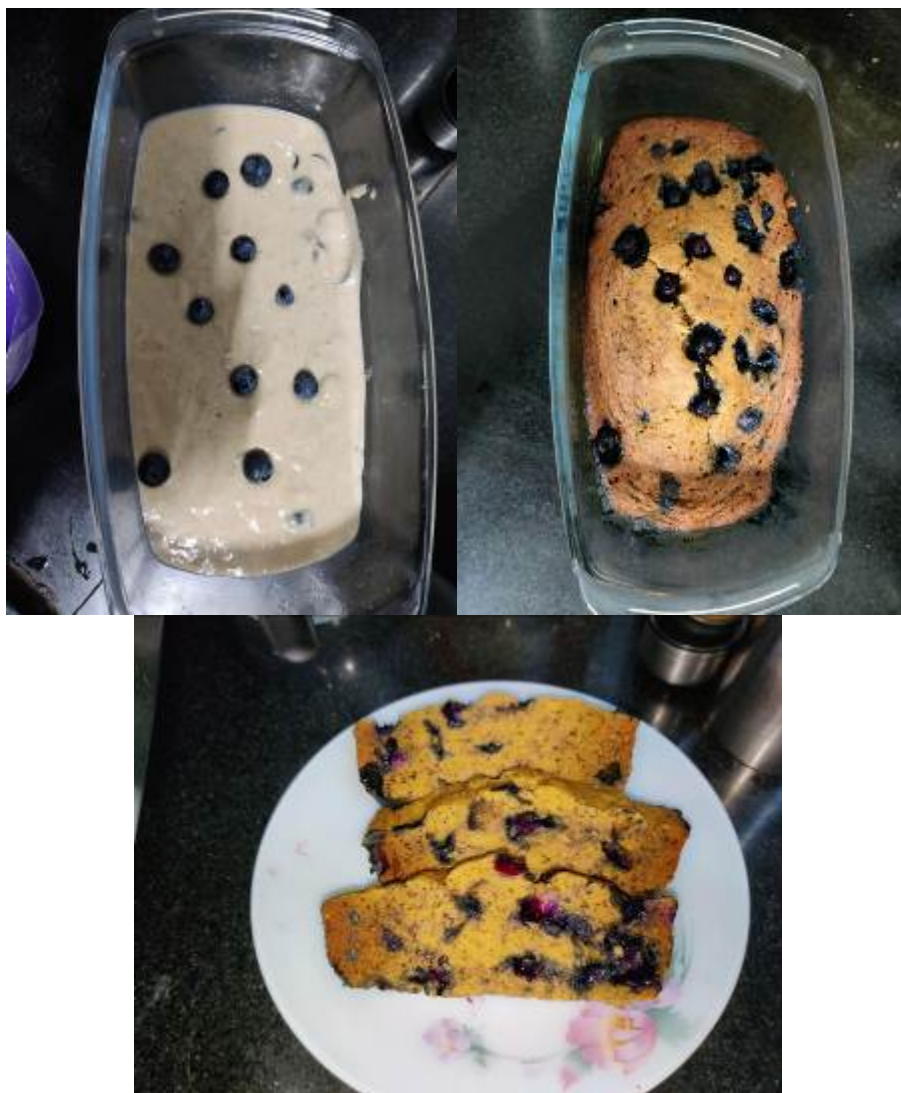


Figure 2.2.1 images of preparation of whole wheat banana blueberry buttermilk bread before and after baking

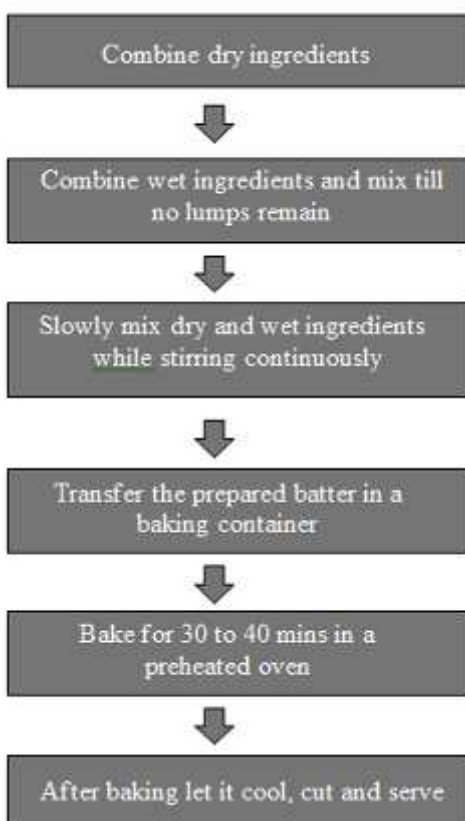


Figure 2.2.2 Flowchart for preparation of Whole Wheat Banana Blueberry Buttermilk Bread.

2.3. Sensory Evaluation:

Sensory Evaluation of all 3 Whole Wheat Banana Blueberry Buttermilk Bread samples was carried out for attributes such as flavor, texture, appearance, and overall acceptability by 10 semi-trained members based on a 9-point hedonic ranking scale. Where 9 = like extremely, 8 = like very much, 7 = like moderately, 6 = like slightly, 5 = neither like nor dislike, 4 = dislike slightly, 3 = dislike moderately, 2 = dislike very much, 1 = dislike extremely.

Three samples were coded as A, B and C. The order of presentation of samples was randomised for each panellist. The samples were kept without giving any prior information about the coded samples. They were supposed to taste it and give a score on the scale.

Once the tasting was done panellists were asked to fill the sensory sheet. Most accepted sample was tested for Total Fat, Moisture, Ash content, Gluten, Protein, Antioxidant Test, Storage study and Microbial Analysis.

3. Result and Discussion:

3.1. Sensory Evaluation Of Whole Wheat Banana Blueberry Buttermilk Bread

The mean scores for sensory of A, B and C are shown in figure. Sample B containing only half amount of stevia as compared to honey that is 1 tsp stevia had the highest score for appearance, texture, taste, consistency and overall acceptability. The removal of honey and reduction of stevia from the bread has improved its texture, taste, by allowing people to get a proper taste of banana and blueberry as well also improving the appearance and consistency.

Sample A and C had an acceptable but slightly average flavour. These samples received lower ratings for look and flavour than Sample B, which had less stevia.

Graphical representation of sensory evaluation.

OVERALL TASTE ,TEXTURE,APPEARANCE AND CONSISTENCY GRADING OUT OF 9

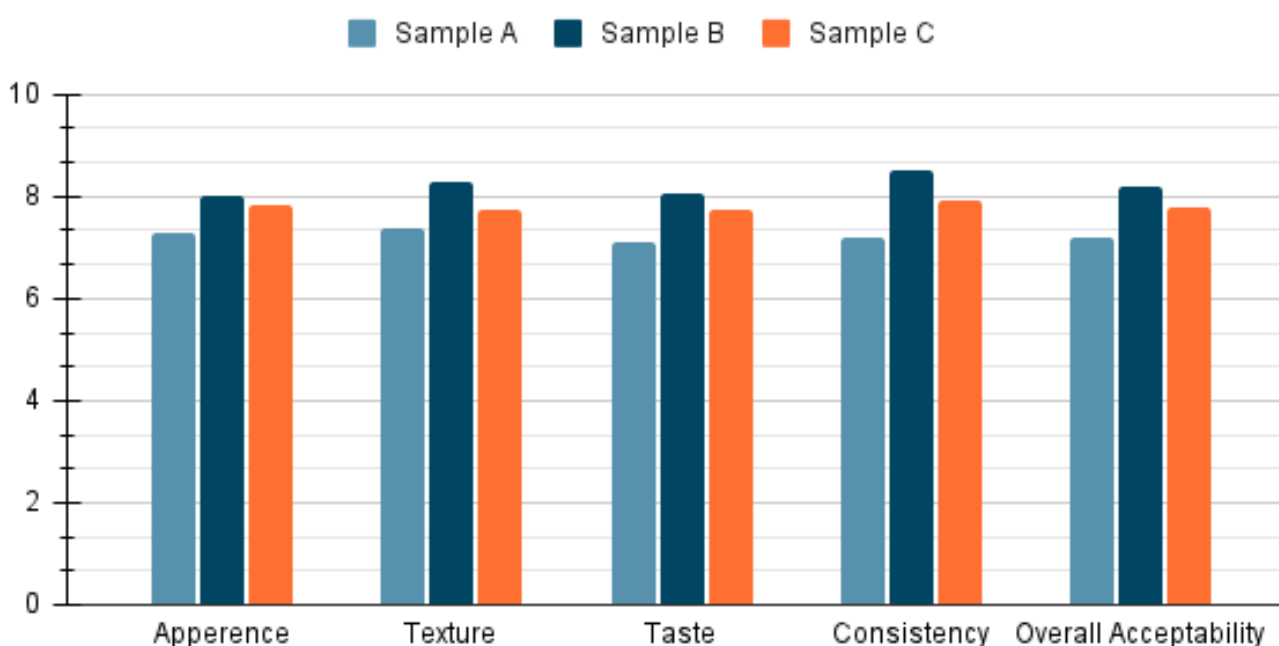


Figure 3.1.1 Sensory Evaluation Parameters

3.2. Test Results of Whole Wheat Banana Blueberry Buttermilk Bread.

Various tests were conducted to analyze different properties of Whole Wheat Banana Blueberry Buttermilk Bread like fat, protein, moisture, ash content, gluten, antioxidant test, microbiological test, storage study were performed in a certified laboratory.

The obtained results are mentioned below.

SN	PARAMETERS	UNITS	SPECIFICATION	RESULT
1	Fat	Gm	--	3.2
2	Protien	Gm	--	2.5
3	Moisture	%	--	16
4	Ash Content	%		1.5
5	Gluten	Gm		1.0
6	Antioxidant Test		Phenolic acid	present
			Flavanoids	present
			Caretenoids	present
			Ferulic acids	present
7.	Microbiological Test			
	E.Coli	MPN/gm		Absent
	Listeria spp	MPN/gm		Absent
	TPC	CFU/mg		Absent
8.	Storage study		Temperature	Room temperature/freeze
			Day	3-4

4. Conclusion:

Whole wheat banana blueberry buttermilk bread is a healthy bread without addition of any preservative in it all ingredients used in it are healthy and plant based. This bread has numerous health benefits because of the ingredients used in it like blueberries and banana which has antioxidant properties and also reduces stress and improves mental health thus making it a healthy option and even tastier than the regular bread.

As the stevia is added and also it being a plant based product it is much sweeter than a regular sweetener thus added in very less quantity and thus safe for consumption for diabetics as well. By adding the vinegar with baking soda combined the mixture can substitute the egg thus can be consumed by vegetarians and vegan people. The addition of blueberries gives it a sour tangy flavour to the bread thus making it tasty with healthy. Using nondairy greek yogurt makes it good and easy to digest for lactose intolerant people. Also this bread is made by using buttermilk thus additional yeast was not used for fermentation as the bacteria in buttermilk that is *Lactobacillus bulgaricus* itself naturally allows fermentation in bread.

Compliances with ethical standards

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Disclosure of conflict of interest

The authors declare that there is no conflict of interest.

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