

# Boosting Athletic Edge: Crafting a Nutrient-Packed Pre-Workout Snack with Beetroot, Bananas and Oats

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**Abstract:** Athletic performance is influenced by a range of factors that includes genetics, training recovery and nutrition while the food plays an important role in enhancing an athlete's performance, recovery and long term health. Athletic performance determines success in training and competition. Beetroot is used to enhance athletic performance due to the presence of dietary nitrate which gets converted to nitric oxide that leads to various functional benefits in the body. Bananas are a great source to replenish the lost glycogen stores. Bananas are rich in potassium that helps to prevent muscle cramps and helps in proper muscle functioning. Oats is beneficial for athletes as it helps in muscle recovery, repair and to provide energy for a longer duration of time. The combination of these three ingredients together for the development of a healthy pre-workout snack had been made. **Objective:** This study aims to develop a healthy pre workout snack that provides sufficient energy for the athletes. **Methodology:** Two variants were developed, first variant with beetroot powder and the variant with boiled beetroot and cocoa powder to see the major acceptable product. The sensory evaluation was done for both the variations. **Conclusion:** The Results showed that the mean scores of beetroot pancakes are higher compared to that of the cocoa pancakes.

**Keywords:** beetroot, athletic performance, pre – workout nutrition, muscle recovery, energy enhancement

**Abbreviations:** tbsp - tablespoon, tsp – teaspoon

## Research highlights

- This is a new product innovation from basic ingredients
- To develop a healthy pre workout snack that is beneficial for the athlete.
- It is nutritionally dense snack that provides adequate nutrients for pre- workout.
- These pancakes can be made easily at home with basic ingredients available.

## 1. Introduction

A study (Benjamin et al., 2025) showed that beetroot is one among the six ergogenic supplement that is used to optimize performance while doing the exercise<sup>1</sup>. Beetroot have antioxidant substances such as flavonoids, anthocyanin's and betaine that also have cardio protective properties<sup>1</sup>. Eating Bananas as a post workout snack has benefits can improve performance and promote recovery. Bananas consist of anti-oxidant properties that helps in reducing inflammation thus enhances recovery. Incorporating bananas post workout will help to replenish energy stores and promote overall body wellness (Chen et al., 2021). Oats is one of the nutritional whole grain that consist of various micronutrients such as vitamin B1, B6, folate, zinc, iron, copper, pantothenic acid, Manganese, Magnesium. Oats have antioxidant, anti-inflammatory, wound healing immunomodulatory and some other properties. A 40g serving of oats qualifies as one of the good or excellent source of protein, fiber, iron, magnesium, phosphorous, zinc, copper, magnesium, manganese according to US FDA nutrition claim regulations or as a source of

nutrient under EFSA regulations. Oats consist of low glycemic index that are rich in complex carbohydrate that helps to provide steady release in energy that are required for endurance athletes (Stevenson et al., 2005). Oats consists of protein about 11-15 % of their weight which contains amino acid that helps to support recovery when taken in combination with milk and nuts (Lemon et al., 2000). Bananas are rich in carbohydrates that makes them a great source for long duration workouts. Pancakes are similar to our Indian dish, dosa. Pancakes are rich in carbohydrates that help to provide the main source of energy to athletes. Pancakes made with bananas and milk helps to give potassium and calcium to help maintain hydration and prevent muscle cramps (Maughan et al., 2010). Therefore, these 3 ingredients oats, beetroot and banana show numerous health benefits. An idea of developing a product that would help in the recovery of athletes or to replenish their energy as a post workout snack with the combination of these three ingredients has led into an idea of creating a healthier version of a pancake.

## 2. Materials

The ingredients required to create this healthy beetroot banana post workout pancake (Variation - 1) includes 1 medium size banana, ½ boiled beetroot or you can use beetroot powder 1.5 tsp based on your convenience along with 5 tbsp of oats, ½ teaspoon of baking powder with 2 -3 tbsp. of honey for the sweetness and flavor and milk 50 – 60 ml based on the requirement and consistency of the batter. Butter or oil can be used on the pan before making the pancake so that it doesn't stick. Variation – 2 includes one

additional ingredient to the above list of ingredients which is the cocoa powder of around 1 -2 tsp for the chocolaty flavor.

**Table 1:** Ingredients and quantity used to make two variation

	Variant 1	Variant 2
Ingredients	Quantity Required	Quantity Required
1 medium sized banana	60 g	60 g
Beetroot	50g	50g
Oats	60g	60g
Honey	20-30 ml	20-30 ml
Milk	50 ml	50 ml
Baking powder	5g	5g
Butter	5 g	5 g
Cocoa Powder	-	5 g

**Table 2:** Nutrient – Value of the Beetroot Oat Pancake

S no	Item	Quantity	Energy	Carbohydrate	Protein	Fat	Fiber
1.	Banana	60 g	64	14	1	0	1.398
2.	Beetroot	50 g	18	3	1	0	1.655
3.	Oats	60 g	233	40	10	4	6.36
4.	Honey	30g	76	21	0	0	0.05
5.	Milk	50 ml	36	2	2	2	0
6.	Baking powder	5 g	3	1	0	0	0
7.	Butter	5 g	36	4.06	0	0.04	0
	1 pancake (23 g)		116.5 kcal	21.3g	3.5 g	1.51g	2.35 g

### 3. Methodology

The methodology used in preparation of both variants are the same, with slight difference in the ingredients used only.

- Firstly, blending of oats into a powdered form then including ½ teaspoon of baking powder, then adding of a whole banana and pouring the 50 ml milk along with ½ medium boiled beetroot into the blender and blending it together like a thick paste or mixture.
- After the mixture is made pour it into a bowl and then add around 2 tbsp of honey and mix it well.
- Now take a pan and heat it in lower flame for some time then add oil or butter 1 tsp and then take a ladle of the batter make sure the batter is not too runny but a little flowy and thick.
- Take a ladle of batter, keep the flame in medium and pour it on the pan into small circles in the shape of a pancake and wait for some time for it to cook, when you can see

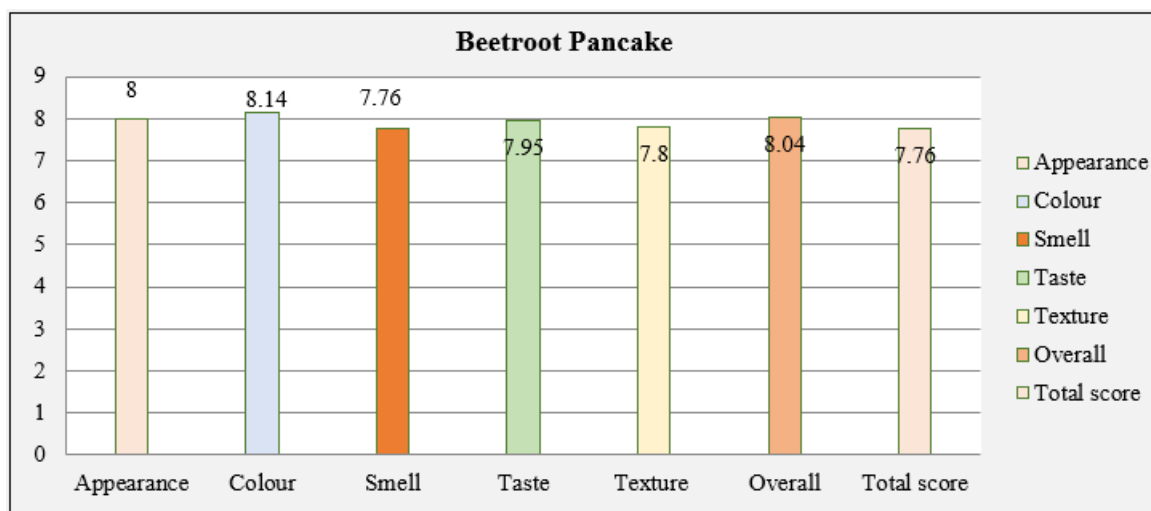
small bubbles on top of the pancake it means its cooking well just wait for it and flip it to the other side before it burns and cook the other side as well for around 2 minutes and place it on the plate once done.

- For the (Variation -2) do the same with the additional ingredient of cocoa powder just add 1.5 to 2 tsp of cocoa powder to the batter while adding baking powder and mix.

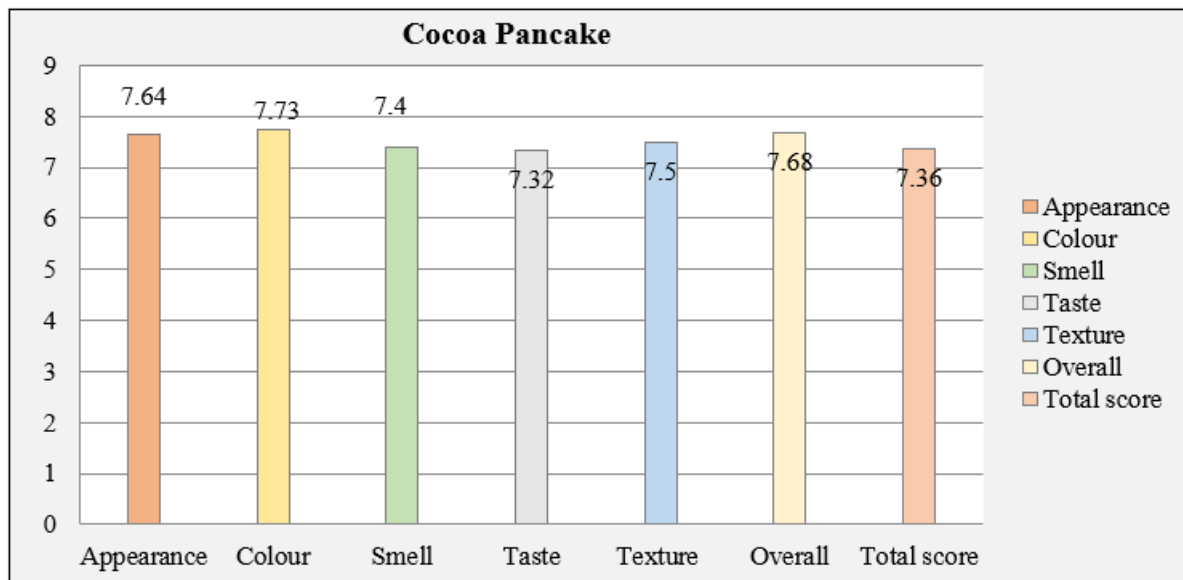
Additionally, based on one's preference you can add white chocolate sauce, honey or chocolate syrup for flavor.

These two variations were sensory evaluated with a panel of 21 members. The members of the panel were given the products for tasting and the products were scored individually based on the hedonic scaling of 0-9.

### 4. Results and Discussion



**Figure 1:** Sensory evaluation showing mean score of variation -1



**Figure 2:** Sensory Evaluation showing mean score of variation – 2

The sensory evaluation of two pancake variations revealed notable difference in their attributes. Variation 1 obtained higher ratings among all parameters. On the basis of appearance, it had a mean score of 8 which indicates that the panelists found it visually appealing and the colour was rated comparatively higher of 8.14. The smell of variation 1 is around 7.76 showing that it had pleasant aroma. The taste which is the crucial factor was rated 7.92 and the texture was scored of 7.80 showing that it had desirable mouthfeel and consistency. Overall score of variation 1 received an overall acceptability score of 8.04 which showcases its extremely liked by the panelists when compared with the cocoa beetroot pancakes. The sensory evaluation of variation 2 showed a score of 7.6 in terms of appearance and the colour showed a mean score of 7.73 which is slightly lower than variation-1. The taste an overall factor received a score of 7.68 which the panelists found it satisfactory but the scores were slightly less compared to variation -1. The standard deviation of variation-1 is  $SD = 0.97$  and variation-2 is  $SD = 0.95$  which shows the difference in two variations. Henceforth variation -1 the

beetroot banana pancake is mostly preferred when compared to variation -2 which is the cocoa pancake.

## 5. Conclusion

On the basis of sensory evaluation, variation -1 was well accepted by panelists as it received higher ratings on the basis of appearance, colour, smell, taste, texture and overall acceptability. The results suggested that this variation of pancake is more visually appealing, has a pleasant aroma and offers a well-balanced taste and texture. Based on overall acceptability it can be concluded that variation -1 which is the beetroot banana pancake showed higher mean scores and has a strong consumer preference. Variation -2 was liked by the panelists but it had a lower overall acceptability score and has the potential to show improvement in terms of flavor and aroma. The product was planned to introduce in the mess of Sports Authority Of India, Bengaluru for the benefit of the athletes.



**Figure 3:** Variation -1 Beetroot Banana Oat pancake glazed with chocolate sauce



**Figure 4:** Variation -2 Cocoa powder beetroot oats banana pancake glazed with honey

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## Note

The paper has not been published elsewhere and also is not under review for publication in another journal.