



## PREPARATION AND QUALITY EVALUATION OF MORINGA BASED WHEY BEVERAGE

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**ABSTRACT** Consumers no longer perceive beverages to be thirst-quenchers; instead, they seek specialised usefulness, which becomes a part of their lifestyle. For today's busy consumers, ready-to-drink (RTD) beverages provide convenience and mobility. As a result, the goal of our project was to create a functional beverage fortified with moringa leaves powder. Various combinations of whey powder and moringa powder were attempted as (C, S<sub>1</sub>, S<sub>2</sub>, S<sub>3</sub>) in our exploratory investigations. Its major goal is to increase moringa consumption. The purpose of this study was to determine the physicochemical and microbiological characteristics of a beverage made from whey and moringa leaves powder. Moringa leaves powder was introduced in various concentrations (5, 10, 15g), while the whey syrup remained constant. Chemical and microbiological tests were performed on Moringa whey beverage. Sensory examination revealed that blend S<sub>1</sub> outperformed blend S<sub>2</sub>. When compared to other blends, it has performed admirably. In comparison to other blends, S<sub>3</sub> offers the best nutritional properties. Moringa and whey powder are a good alternative for the dairy sector when it comes to developing beverages, particularly for nutritious foods.

**KEYWORDS :** RTD, Whey, Moringa, Powder, Beverages

### INTRODUCTION

People's economic standing has improved, and their interest in health and well-being has grown, resulting in the consumption of natural and health-promoting food products. For today's busy consumers, ready-to-drink beverages offer the most benefit and convenience. This is the finest advantage and convenience. As people become more conscious of health issues, they consume more juices and natural products. Increased consumption has resulted in a greater variety of juices and beverages. In the last two decades of manufacturing and consumption, the soft beverage business has grown in popularity. In the Indian market, there is a limited selection of ready-to-drink beverages (RTD). Nowadays, the consumption of phenolic-rich beverages is widespread. Many people rely on plant-based beverages to help them control their appetite, digest their food fast, and maintain their health.

Most people are familiar with the Moringa tree. To today's busy consumers, this is the finest advantage and convenience. As people become more conscious of health issues, they consume more juices and natural products. In India, the quantity of consumption has increased in lockstep. For reasons that will be explained throughout this study, this intriguing plant is poised to make an impact on the beverage, food, and health industries. Moringa leaves have been found to contain 46 antioxidants and 92 minerals. Moringa powder appears to be used in salads, smoothies, teas, energy bars, soups, salads, smoothies, dietary supplements, and tea bags by the majority of people. Moringa as a food source suggests that the leaves not only give good nourishment, but also help to prevent diabetes, hypertension, and boost breast milk expression in adults. Malnutrition and protein substitutes are major contributors to child mortality in India. Moringa leaves are consumed raw or cooked with other vegetables and grains for nourishment. The dried powder from the leaves is added to soups, sauces, or cuisine to increase the nutritional content, and it is also used as a health drink in supplement form. The leaves also have pharmacological effects in human bodies, such as analgesic, antihypertensive, anticancer activity, and anti-inflammatory properties.

The watery part of milk is where whey is found. The fatty portions of the milk coagulate during cheese production, and the whey is removed as a byproduct. After being separated during cheese manufacture, whey goes through a series of processing procedures to generate whey protein, which is a powder that is commonly used in baking. Because of the huge potential for employing whey solids, a range of whey beverages, including plain, carbonated, alcoholic, soy, and fruit, have been successfully manufactured and marketed all over the world. Whey powder has unique nutritional and functional qualities that provide customers with a high level of protein. Whey proteins are

scarce, yet they pack a punch in terms of protein efficiency. Plain, alcoholic, carbonated, and fruit-flavored whey-based beverages are available. White drinking milk and flavoured milk products make up milk-based drinks.

The main objective of this study is to develop whey beverage by using different concentrations of dried moringa leaf powder. And Enrichment of Functional drink with moringa leaf powder. To assess nutritional parameters of moringa based whey beverage. To conduct the Organoleptic properties of moringa based whey beverage. To study the shelf life studies of moringa based whey beverage.

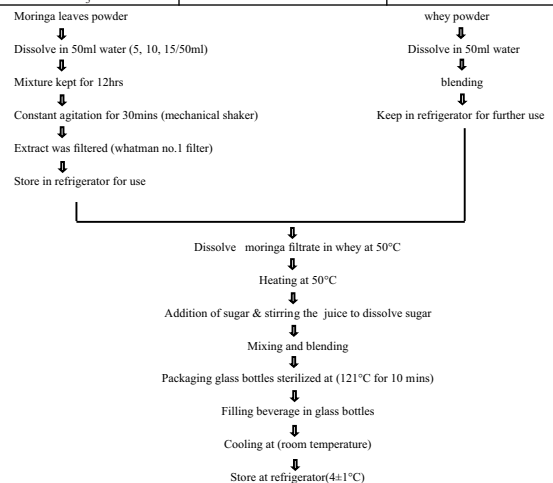
### MATERIALS AND METHODS

**Raw Materials:** Moringa powder, whey powder, sugar, water. The Fresh Moringa leaves were obtained from a farm in Nizamabad. Whey powder was purchased from the local market in Hyderabad.

**Methodology:** The experiment was planned to study the acceptable levels of 5, 10, 15 g of adding moringa leaves powder in four treatments

**Table 1 Treatments Details**

S.No	Moringa : water	Whey : water
Control	---	10:100
S <sub>1</sub>	5:50	5:50
S <sub>2</sub>	10:50	5:50
S <sub>3</sub>	15:50	5:50



**Flow chart for preparation of moringa based whey beverage**



**Fig 1: moringa based whey beverage**

**Chemical analysis of formulated moringa based whey beverage.**  
 Chemical analysis such as protein, ash, total sugars, reducing sugars, titratable acidity, pH value for formulated moringa based whey beverage using AOAC method (2000).

**Mineral analysis of formulated moringa based whey beverage**  
 Mineral analysis such as calcium, potassium, magnesium for formulated moringa based whey beverage using AOAC method (2000).

**Sensory evaluation for moringa based whey beverage**  
 Based on 9 point hedonic scale ranging from point 9 like extremely to 1 dislike extremely on Moringa based whey beverage showed as overall acceptability (American MA, 1967).

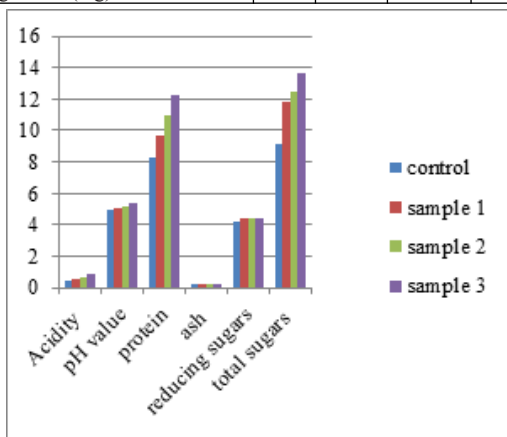
**Microbial analysis for formulated moringa based whey beverage**  
 Total plate count for formulated moringa based whey beverage is done by method (cruikshank et al., 1975)

**RESULTS AND DISCUSSION**

The present study entitled “Preparation and quality evaluation of Moringa based Whey Beverage” to study sensory qualities and chemical analysis of beverage with addition of moringa leaves powder in different concentrations levels and chemical composition of beverage such as protein, ash, moisture, titratable acidity, pH, Colour, Taste, Flavour, Consistency, Overall acceptability.

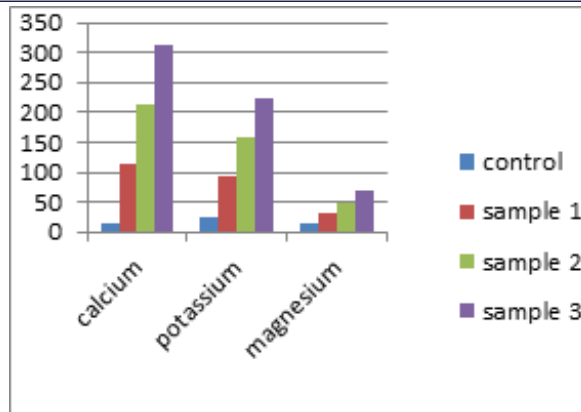
**Table 2 Chemical Composition Of Moringa Based Whey Beverage**

Chemical parameters	C	S <sub>1</sub> (5%)	S <sub>2</sub> (10%)	S <sub>3</sub> (15%)
Titrable acidity	0.48	0.52	0.61	0.82
pH value	4.9	5.1	5.2	5.4
Protein	4.44	5.795	7.15	8.05
Ash	0.18	0.23	0.25	0.27
Reducing sugars%	4.20	4.38	4.39	4.40
Total sugars%	9.10	11.8	12.5	13.6
Calcium (mg)	13.5	113.65	213.8	313.95
Potassium (mg)	25.88	92.08	158.28	224.48
Magnesium(mg)	13.85	32.25	50.65	69.05



**graph :1 Chemical Composition of Moringa based whey Beverage.**

The chemical analysis in moringa based whey beverage indicates that S3 sample has highest in acidity and pH value it might be due to the ascorbic acid present in moringa. Protein and ash content is low in S1 and high in S3 because the protein content in moringa is high. Reducing sugars and total sugars has highest in S3 compare to other formulations it might be due to high amount of carbohydrates present in moringa.



**graph :2 mineral analysis of moringa based whey beverage**

The mineral content in S3 as highest in minerals compare to other formulations. mineral content increases due to the high addition of moringa leaves powder in S3 compare to other formulations.

**Table 3 Total Colony Count**

Sample	Dil. qty	5days	10days	15days	Cfu/ml (15 days)	Log(cfu) 15days
control	10 <sup>4</sup>	0	0	0	0	0
	10 <sup>5</sup>	0	0	0	0	0
S <sub>1</sub>	10 <sup>4</sup>	10	39	68	6.8×10 <sup>6</sup>	6.8325
	10 <sup>5</sup>	8	29	56	6.8×10 <sup>6</sup>	7.7481
S <sub>2</sub>	10 <sup>4</sup>	7	25	55	5.5×10 <sup>6</sup>	6.7403
	10 <sup>5</sup>	6	20	42	4.2×10 <sup>7</sup>	7.6232
S <sub>3</sub>	10 <sup>4</sup>	6	18	45	4.5×10 <sup>6</sup>	6.6532
	10 <sup>5</sup>	5	15	40	4.0×10 <sup>7</sup>	7.6020

There was slight increase in their colony count as compared to 10 days of shelf life. For next 20 days there was increase in the TPC in control sample and other sample. The which was found less TPC count are more acceptable after 15 days of shelf life. During 15 days of refrigerator storage the product remained safe.

**CONCLUSION**

In response to the demand, it was decided to make a nutritionally enhanced functional drink with whey and moringa leaf powder. It was determined that juice treated with S1(5%) was the most effective beverage in terms of acidity and sensory evaluation, with a higher and better consistency score up to the end of storage. Moringa leaves powder with the greatest S3 (15%) content offers the most nutritional value and general acceptability. It may be concluded that the creation of a moringa-based whey beverage is feasible in terms of customer acceptance.

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