



“An Organoleptic And Proximate Evaluation Of Millet Based Developed Product”

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Abstract

Weight loss therapy encompasses various treatment which aim to achieve weight loss and maintain good health. Regular physical activity and Diet and nutrition are important factors in the promotion and maintenance of good health and weight management also in the prevention of chronic diseases. Food product development is a process of developing a new product which involves innovative ideas, formulation, commercialization and testing of the product. It can also play a major role in benefiting the business to remain competitive, ensure food safety and satisfy the consumer expectations. This study was based on product development in which product was developed using Pearl millet in order to promote weight loss and provide rich source of iron specially to pregnant women and anemic patient. The sensory evaluation of product was done in order to compare the T0 controlled product (rice flakes chivda) and T1 experimental product (bajra flakes chivda). The data revealed that color attributes for T0 (12.76 ± 3.70) followed by T1 (17.66 ± 1.74), the flavor parameter for T0 (13 ± 4.07) followed by T1 (18.22 ± 1.72), the taste parameter for T0 (13.36 ± 3.90) followed by T1 (18.7 ± 1.64), the texture attribute for T0 (13.16 ± 4.26) followed by T1 (18.12 ± 1.83), the overall acceptability for T0 (13.24 ± 4.64) followed by T1 (19.1 ± 1.40). The result revealed that T1 was more acceptable in all the parameters than T0. The nutritional evaluation of product ash for T0 (0.85 ± 0.04), T1 (1.59 ± 0.77), moisture T0 (12.45 ± 7.20), T1 (13.25 ± 1.17), protein T0 (6.9 ± 3.98), T1 (9.73 ± 2.13), fat T0 (1.2 ± 0.7), T1 (2.18 ± 2.25), carbohydrates T0 (77.45 ± 44.7), T1 (69.88 ± 3.68), energy T0 (346 ± 1), T1 (196 ± 1), iron T0 (21.5 ± 12.4), T1 (7.78 ± 1.25), fiber T0 (1.1 ± 0.64), T1 (0.76 ± 0.53). The result depicted that the product was nutritious and helps in the promotion and maintenance of good health and weight management.

Keywords – Weight Management, Pearl Millet, Product Development, Sensory Evaluation, Controlled Product, Experimental Product, Nutritional Evaluation.

INTRODUCTION

Obesity and overweight are today recognized to be amongst the major health problems of our society. The long-term weight loss results in weight loss programs are usually modest (**Jeffery RW et al.,2000**). The successful weight loss maintenance must include criterion for magnitude of weight loss and its duration. Weight losses of 5-10% of initial body weight can lead to improvement in risk factors for diabetes, heart disease and other health complication (**Serdula MK et al.,1999**). Nutritional assessment plays a crucial role in successful weight loss therapy by evaluating an individual's nutritional status and dietary habits. It include anthropometric measurement – BMI and waist to hip ratio, biochemical assessment, clinical and dietary assessment. It help in design individual diet plan based on calories (**Kushner R.F,& Ryan D.H, 2014**). Weight loss is usually achieved more readily than weight maintenance after body weight loss (**Westerterp-Plantenga MS et al., 2004**). Diets with relatively high protein content act more on target, doubling the protein in diet from normal level of 5-10% to 20-30% reduces food intake which results in immediate body weight loss (**Bagby SP.,2007**). A well plan diet can help a person to achieve weight loss, ensuring overall well being and health. A daily caloric deficit of 500-1000 is recommended with intake of 45-65% Of carbohydrates, 20-30% of fat and 1.6-2.2 gm/day of protein also with essential micronutrients (**Hall K.D.,& Guo J., 2017**). Regular physical activity supports fat loss, muscle retention, and metabolic health. Exercise plays a vital role in maintaining body weight and health. It is recognized as an integral part of the management of person with overweight or obesity (**Jensen MD et al., 2013**). It has positive effect on weight loss as losing of fat from body and prevention of lean mass during weight loss (**Yumuk V et al., 2015**).Diet and nutrition are important factors in the promotion and maintenance of good health and weight management also in the prevention of chronic diseases (**Kimokoti RW, & Millen BE, 2016**). Obese person must reach to a clear understanding of the principles of healthy eating as well as the specific nutrient-disease relationship. Indeed, nutrition knowledge is considered to be the important factor in explaining variation in healthy food choices (**Wardle J et al.,2000**).

Millets are the small-seeded, oldest and drought-resistant cultivated crops/grains, found in various parts of world, particularly in Asia and Africa, providing a staple food source for millions of people (**Upadhyaya HD et al.,2017**). Millets are being promoted as sustainable and nutritious alternatives to conventional cereals like wheat and rice as these are nutrient-rich grains that have global recognition due to their health benefits, climate resilience and role in food security. India is the largest producer of millets, contributing over 40% of global millets production (**Kumar, A. et al.,2018**). There are different types of millets such as Pearl millet, Foxtail millet, Proso millet, Finger millet these comes under major millets based on the global significance whereas minor millets involves Barnyard millet, Kodo millet, Little millet, Browntop millet (**Pragya MP., 2021**). Millets are known for their rich nutritional profile that has crucial benefits on health including supporting digestive health with high dietary fiber content that prevents constipation and promotes gut health, enhance the hearth health as it lower the cholesterol level and reduce risk of cardiovascular diseases, millets has low glcemic index which help in regulating blood sugar level and manage diabetes, good fiber and protein content in millets help in weight management and support weight loss, some millets like finger millet contain high calcium level that supports the bone health, millets helps in preventing celiac disease or gluten intolerance as they are naturally gluten free (**Saleh , AS, et al., 2019**).

Food product development is a process of developing a new product which involves innovative ideas, formulation, commercialization and testing of the product. The global food industry now a days continuously evolving to meet the changing demands of consumers. Innovation in processing technology, food science and nutrition led to the creation of ideal food products that cater to diverse dietary needs and lifestyle preferences (**Earle MD et al.,2017**). It can also play a major role in benefiting the business to remain competitive, ensue

food safety and satisfy the consumer expectations. There are the different stages of food product development that follows a structured approach which involves Idea generation and market research, concept development and feasibility analysis, formulation and selection of the product, processing and manufacturing trials, consumer testing and sensory evaluation, regulatory compliance and labeling, commercialization and market launch (Linnemann AR et al., 2017).

METHODOLOGY

The methodology was followed for “**A Study To Effect The Millet Based Developed Product On Weight Loss Therapy**” done and carried out in 2 phases the first phase was the collection of ingredients & standardization of recipe & it in second phase was development of product & its evaluation. (sensory nutritional and shelf life)

Phase I (Development of product)

- Collection of Ingredients
- Standardization of recipe

Phase II (Evaluation of Developed product)

- Nutritional Evaluation
- Organoleptic Evaluation
- Shelf-Life Evaluation

Collection of raw ingredients

Sample T0

- Rice flakes – 95%
- Oil – 3%
- Curry leaves – 2%

Sample T1

- Pearl millet flakes – 70%
- Puffed rice – 20%
- Peanuts – 4%
- Chana dal – 2%
- Curry leaves – 2%
- Oil - 2%



Standardization of recipe and preparation of product.**Phase 2****Evaluation of Developed Product****Nutritional evaluation**

Energy
Protein
Carbohydrate
Iron
Fiber
Fat
Ash
Moisture

Organoleptic Evaluation

Color
Taste
Texture
Flavor
Overall Acceptability

Shelf Life**Preparation of the product****Step 1: Prepare the ingredients**

- Roast peanuts: Dry roast peanuts in a pan until fragrant. Let them cool.
- Roast chana dal: Dry roast chana dal until lightly browned. Let it cool.

Step 2: Fry the bajra flakes

- Heat oil: Heat oil in a deep pan or kadai.
- Fry bajra flakes: Fry bajra flakes until crispy and golden brown. Drain excess oil.

Step 3: Mix the ingredients

- Combine puffed rice, roasted peanuts, and chana dal: Mix well.

- Add fried bajra flakes: Add the fried bajra flakes to the mixture.
- Add curry leaves: Add curry leaves and mix well.
- Season with salt and spices (if using): Add salt and any desired spices. Mix well.

Step 4: Serve

- Let it cool: Allow the chivda to cool completely.
- Store or serve: Store in an airtight container or serve immediately.

Organoleptic Test

Sensory evaluation: Sensory evaluation is a scientific method used to assess the sensory properties of products, such as food and beverages through human senses. Trained panelists or consumers assess attributes like appearance, aroma, texture, flavor, and overall liking using descriptive analysis or hedonic tests. This evaluation provides valuable insights into product characteristics, consumer preferences, and quality control, helping manufacturers optimize formulations and ensure consistent quality. Sensory evaluation is widely used in various industries, including food and beverages.

Nutritional Evaluation

Nutritional evaluation assesses the nutritional content and value of food, including macronutrients (carbohydrates, proteins, fats) and micronutrients (vitamins, minerals), to determine dietary adequacy, inform food product development, and guide nutrition recommendations, ultimately ensuring food products meet nutritional standards and support public health.

Shelf life evaluation

Shelf life evaluation was done by keeping the products at room temperature in order to observe the shelf life of both the samples, approximately till 30 days of storage.

Statistical Analysis of the Data

The data was interpreted by appropriate strategical packaging tool Microsoft Excel Windows 10

The data was figured out by different processes of data analysis . (Mean / Average , Standard Deviation).

RESULT AND DISCUSSION

1. Organoleptic evaluation of product

Table 3.1 – Mean acceptability score of attributes between the developed samples

Parameters	Samples	
	T ₀	T ₁
Color	12.76±3.70	17.66±1.74
Flavor	13±4.07	18.22±1.72
Taste	13.36±3.90	18.7±1.64
Texture	13.16±4.26	18.12±1.83
Overall Acceptability	13.24±4.64	19.1±1.40

T0 - Controlled Product – Rice flakes chivda (prepared from rice flakes)

T1 – Experimental Product – Pearl millet chivda (prepared from pearl millet and puffed rice)

The organoleptic evaluation by composite scoring of developed product is presented in table 4.1. data revealed that color attributes for sample T0 (12.76±3.70) followed by T1 (17.66±1.74), the flavor parameter for T0 (13±4.07) followed by T1 (18.22±1.72), the taste parameter for T0 (13.36±3.90) followed by T1 (18.7±1.64), the texture attribute for T0 (13.16±4.26) followed by T1 (18.12±1.83), the overall acceptability for T0 (13.24±4.64) followed by T1 (19.1±1.40). The result revealed that T1 was more acceptable in all the parameters than T0.

2. Proximate Analysis of the product

Table 3.2 – proximate analysis of the product (T0, T1) per 100gm

Parameters	Samples	
	T ₀	T ₁
Ash (g)	0.85±0.04	1.59±0.77
Moisture (g)	12.45±7.20	13.25±1.17
Protein (g)	6.9±3.98	9.73±2.13
Fat (g)	1.2± 0.7	2.18±2.25
Carbohydrates (g)	77.45±44.7	69.88±3.68

Energy (g)	346±1	196±1
Iron (mg)	21.5±12.4	7.78±1.25
Fiber (g)	1.1±0.64	0.76±0.53

T0 - Controlled Product – Rice flakes chivda (prepared from rice flakes)

T1 – Experimental Product – Pearl millet chivda (prepared from pearl millet and puffed rice)

The proximate analysis of product is depicted in table 4.2. Regarding Ash, the mean value found in sample ash for T0 (0.85±0.04) and T1 (1.59±0.77), the mean value of moisture in T0 (12.45±7.20) and T1 (13.25±1.17). Regarding protein, the mean value of sample T0 (6.9±3.98), T1 (9.73±2.13), the mean value of fat in T0 (1.2±0.7), T1 (2.18±2.25), for carbohydrates T0 (77.45±44.7), T1 (69.88±3.68), energy T0 (346±1), T1 (196±1), iron T0 (21.5±12.4), T1 (7.78±1.25), fiber T0 (1.1±0.64), T1 (0.76±0.53).

3. Shelf Life Evaluation

In shelf life evaluation, the product was kept under observation at room temperature and the result concluded that both the samples (T0 and T1) were found safe and permissible at room temperature till 30 days of storage.

CONCLUSION

Weight loss management and maintaining good health promotes through regular physical activity and diet and nutrition. It also help in the prevention of chronic diseases. Food product development involves innovative ideas, formulation, commercialization and testing of the product. Millets are the oldest known crop to humans. Due to urbanization and industrialization, the importance of millets and their cultivation has declined as a consequence of large-scale rice and wheat cultivation. Millets have emerged as a viable option for healthy living and can reduce the incidence of various lifestyle diseases. This study was based on product development in which product was developed using Pearl millet in order to promote weight loss and provide rich source of iron specially to pregnant women and anemic patient. The sensory evaluation and nutritional evaluation was done to compare the T0 controlled product (rice flakes chivda) and T1 experimental product (bajra flakes chivda). The organoleptic evaluation by composite scoring of developed product data revealed that T1 was more acceptable in all the parameters than T0 also safe and permissible at room temperature till 30 days. The result depicted that the product was nutritious and helps in the promotion and maintenance of good health and weight management.

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