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Saladi Lakshmi Keerthana
 Department of Food Technology and Nutrition, School of Agriculture, Lovely Professional University, Phagwara, Punjab, India

Sonia Morya
 Department of Food Technology and Nutrition, School of Agriculture, Lovely Professional University, Phagwara, Punjab, India

Rohit Sawan
 Department of Food Technology and Nutrition, School of Agriculture, Lovely Professional University, Phagwara, Punjab, India

Corresponding Author:
Sonia Morya
 Department of Food Technology and Nutrition, School of Agriculture, Lovely Professional University, Phagwara, Punjab, India

Process standardization and quality evaluation of nutri-mix oats cookies

Saladi Lakshmi Keerthana, Sonia Morya and Rohit Sawan

Abstract

The majority of people's diets are not nutrient-rich. Hence, cookies can be a way to provide nutrition by creating cookies that are nutritionally superior, which can also help in the prevention of several health issues like obesity, celiac disease, and osteoporosis. Osteoporosis is a condition that affects the bones. Bones become sufficiently fragile due to osteoporosis' extremely low bone density. Fractures occur more frequently as bones get thinner and more brittle. In children, osteoporosis is a rare condition. Most often, it affects elderly people, especially those over 65. Females are more likely than males to develop osteoporosis, and this is especially true for women after menopause. Having a good, high fibre-enriched diet is one of the most crucial ways to prevent obesity. Therefore, there is a critical need for research in the food industry for producing high fibre food supplements. In the current investigation, nutrimix was used as fibre source for making cookies out of oats. Gluten free cereals are used in cookies to meet both the daily fibre needs of the general population and fibre requirements of obesity patients.

Keywords: Cookies, obesity, gluten free, fibre, good health & well-being

Introduction

The demand for ready-to-eat snacks is rising in the modern world as people's lifestyles change. Cookies are the most popular and preferred among these ready-to-eat snacks among all age groups since they are cheap, have a long shelf life, are less likely to develop microorganisms, are filling, and have a long shelf life. The majority of people's diets are not nutrient-rich. Hence, cookies can be a way to provide nutrition by creating cookies that are nutritionally superior, which can also help in the prevention of several health issues like obesity, celiac disease, and osteoporosis. Maintaining a suitable fibre-enriched diet is one of the most crucial ways to avoid obesity (Seelam *et al.*, 2017) [7]. Thus, a Recommended Daily Intake (RDI) has been established by the Food and Agricultural Organization (FAO) and United Nations based on various age groups. The recommended daily fibre intake for men is 30g of fibre each day, and for women is 25g each day. Nonetheless, our food has a very low daily fibre consumption (Lewis, 2019) [7].

Gluten-free (GF) products are indispensable for people with celiac disease because till date the only treatment is to follow a GF diet. Besides this, nowadays, people are more interested in following a healthy diet, so they are looking for nutritious food (Susman *et al.*, 2021) [6].

Material and Methods

The present study was carried out in the Department of Food Processing and Technology, Lovely Professional University. The ingredients Nutrimix powder (poppy seeds, sesame seeds, watermelon seeds and flax seeds) etc. used in the study were procured from the local market of Jalandhar, (Punjab). Humans have ingested flaxseed for its health benefits, nutritional value, and fibre content since prehistoric times. According to Morya *et al.* (2022) [4], flaxseed has 19.50 g of protein, 34.30 g of carbohydrates, 42.16 g of fat, 27.3 g of fibre, 255 mg of calcium, 392 m of magnesium, 642 m of phosphorus, 434 m of zinc, 1.64 m of thiamine, 0.16 m of riboflavin, and 3.08 m of niacin (Gupta and Morya, 2022) [3].

Table 1: Different combinations of Nutri-mix and oats flour

Symbol	Composition
R ₁ O ₁ N ₁	60% +40%
R ₂ O ₂ N ₂	50% + 50%
R ₃ O ₃ N ₃	75% + 25%

Where, R=Replication, O=Oats, N=Nutri-mix

Procedure

Other necessary ingredients including sugar, shortening, baking powder, and milk were combined with the blends. Plain butter was added to the mix to help the cookies stay together because the components were entirely gluten-free and hence unable to serve as a binder. They made cookies using the standard creamery procedure. A dough of the

desired consistency was created by completely combining and kneading the components. For around 10 minutes, the dough was let to stand. Then, with the use of a roller and a pin, it was made into a sheet of uniform width. A preheated oven at 200 °C was used to bake the additional cookies for around 15minutes.

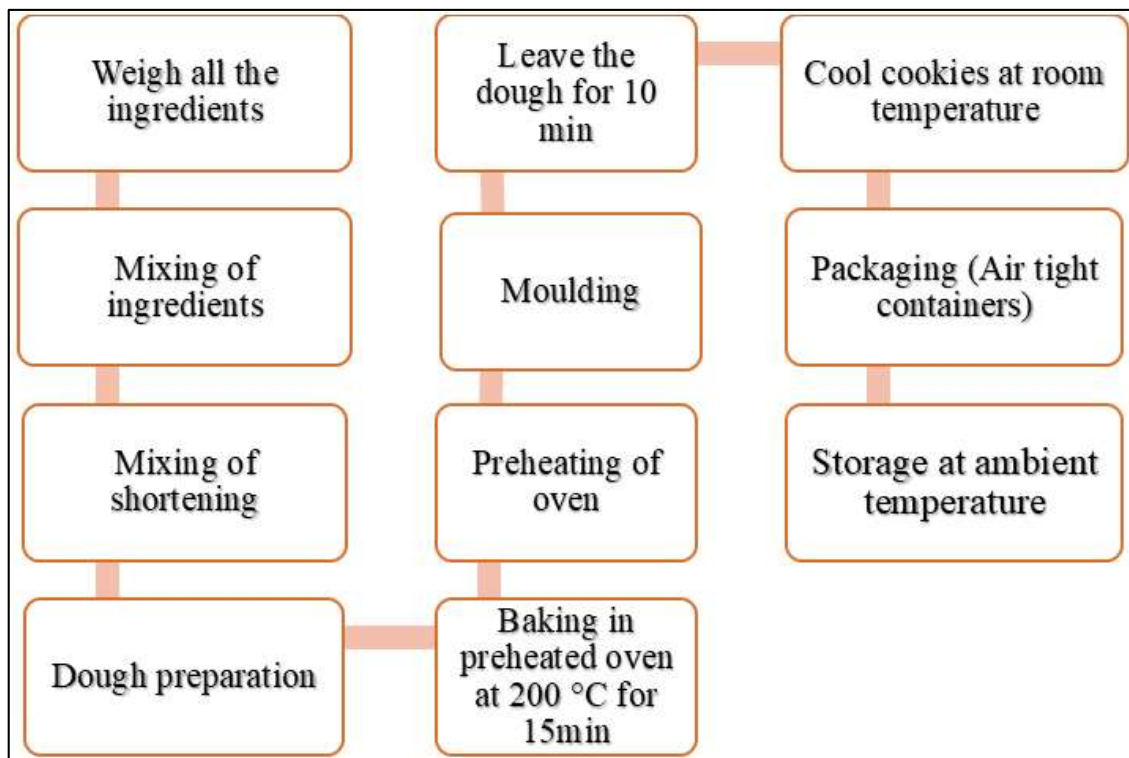


Fig 1: Flow-sheet of preparation of nutri-mix oats gluten free cookies



Fig 2: Nutri-mix oats gluten free cookies

Proximate analysis

Proximate analysis was done by using standard methods of analysis given in Association of Analytical Chemistry (AOAC, 2019) [1]. Fat estimation by soxhlet method, protein

estimation by Kjeldahl method, carbohydrate by difference method, ash estimation by muffle furnace, moisture estimation by hot air oven method.

Table 2: Proximate analysis of prepared gluten free cookies

Treatments	Moisture%	Protein%	Fat%	CHO%	Ash%
R ₁ O ₁ N ₁	1.96±0.02 ^b	6.25±0.04 ^b	22.53±0.35 ^a	66.67±0.03 ^a	3.84±0.15 ^{ab}
R ₂ O ₂ N ₂	1.99±0.02 ^a	5.53±0.02 ^d	20.70±0.10 ^b	62.91±0.11 ^c	3.64±1.14 ^b
R ₃ O ₃ N ₃	1.67±0.01 ^d	6.78±0.06 ^a	20.38±0.45 ^d	57.65±0.01 ^d	3.98±0.01 ^a
R ₄ O ₄ N ₄	1.92±0.02 ^c	6.18±0.01 ^c	22.05±0.10 ^a	66.62±0.26 ^b	3.80±0.10 ^{ab}
R ₅ O ₅ N ₅	1.99±0.01 ^a	5.21±0.02 ^e	20.50±0.10 ^c	62.87±0.01 ^c	2.88±0.10 ^c
R ₆ O ₆ N ₆	1.67±0.01 ^e	6.81±0.15 ^a	20.15±0.04 ^c	57.61±0.10 ^d	3.90±0.01 ^{ab}

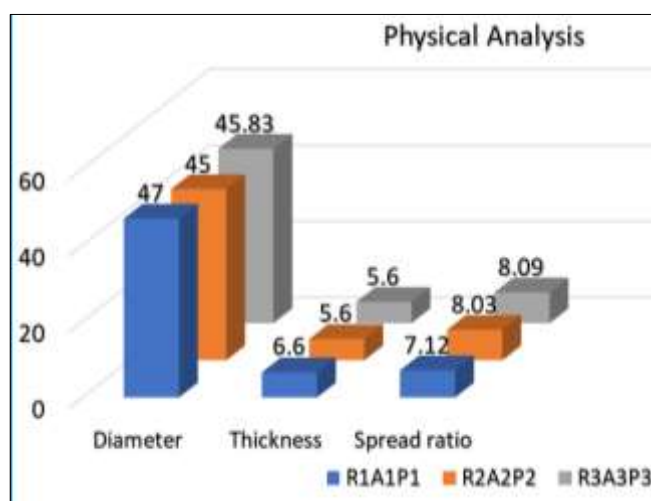
Data are presented as mean ± SD

Physical Analysis

By estimating the diameter, thickness, spread ratio, and color of the gluten-free, high fibre cookies that were manufactured, physical examination of treatments was performed. Diameter, thickness, and spread ratio of the treatments are compared in table 3. Cookies were placed edge to edge, and the width (diameter) was estimated to the closest mm (AACC, 1962) [2]. Six cookies were stacked to test the height's thickness, and the average value was determined. By dividing the average diameter (D) by the average thickness (T) of cookies, it was determined (AACC, 1962) [2].

Table 3: Physical analysis of prepared nutri-mix oats gluten free cookies

Treatments	Diameter	Thickness	Spread ratio
R ₁ O ₁ N ₁	47	6.6	7.12
R ₂ O ₂ N ₂	45	5.6	8.03
R ₃ O ₃ N ₃	45.83	5.6	8.09

**Fig 3:** Graphical representation of physical analysis of Nutri-mix oats gluten free cookies

Color Analysis

The results of the color analysis (Table 4) indicate that the treatment R₁O₁N₁ had the highest hue (60.90), whereas R₂O₂N₂ had the lowest hue (20.17). Using a Hunter Colorimeter, the cookies' instrumental color values (L, a, and b) were calculated. The attribute of color observation known as hue (ho) designates an object as having the chroma of red, yellow, green, blue, and so on. L value, which goes from 0 for black to 100 for white, indicates how bright something is. And using the range of 0 (black) to 100, the results of cookies' L values can be simply understood (White). The remaining two a and b stand for, respectively, yellowness (b) positive values to blueness (b) negative values and redness (a) positive values to greenness (a) negative values. As a result, the

sequence of redness of treatments is R₂O₂N₂> R₃O₃N₃> R₃O₃N₃. Moreover, the sequence of treatments' yellowness is R₁O₁N₁> R₃O₃N₃> R₂O₂N₂. The characteristic of color known as C (Chroma) is typically used to describe how much a color differs from a grey of the same brightness. Because of this, the order of treatment greyness is R₁O₁N₁ > R₂O₂N₂> R₃O₃N₃.

Table 4: Color analysis of prepared Nutri-mix oats gluten free cookies by Hunter lab colorimeter

Treatments	L*	a*	b*	c*	h°
R ₁ O ₁ N ₁	29.34	4.85	8.72	9.98	60.90
R ₂ O ₂ N ₂	19.14	8.22	3.02	8.76	20.17
R ₃ O ₃ N ₃	21.27	5.23	6.07	8.03	49.35

Conclusion

Samples of gluten-free oats cookies are high in fibre. Samples of gluten-free cookies have an acceptable level of proximate composition such as moisture, carbohydrate, protein, fat, and ash and are nutritionally sound. These samples have also passed sensory testing. The amount of nutrimix in the cookies increased along with their nutritional content. Because cookies are enjoyed by a large population and by people of all ages, the study demonstrated that cookies enhanced with nutrimix powder of poppy seeds, sesame seeds, watermelon seeds and flax seeds and provide an adequate supply of fibre. According to statistical research, sesame seeds, watermelon seeds and poppy seeds flour can be successfully combined to create high fiber gluten-free oats cookies. The formulated cookies can be help to achieve sustainable development goal 3 i.e. good health & well-being.

Conflict of interest: The authors declared no conflict of interest.

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Reference

1. AOAC International. Official Methods of Analysis. 21th ed. Association of Official Analytical Chemists; Rockville, MD, USA; c2019.
2. AACC (American Association of Cereal Chemists.): AACC approved methods. Sixth ed. The Association. St. Paul, Minn. 1962;2:154.
3. Gupta N, Morya S. Bioactive and pharmacological characterization of Chenopodium quinoa, Sorghum bicolor and *Linum usitatissimum*: A review. Journal of Applied and Natural Science. 2022;14(3):1067-1084.
4. Morya S, Menaa F, Jiménez-López C, Lourenço-Lopes C, BinMowyna MN, Alqahtani A. Nutraceutical and Pharmaceutical Behavior of Bioactive Compounds of Miracle Oilseeds: An Overview. Foods. 2022;11(13):1824.

5. Seelam BS, David J, Singh N, Morya S. Sensory Properties and Microbial Characteristics of Cookies Prepared from Refined Wheat Flour Supplemented with Sweet Potato Flour and Whey Protein Concentrate. *International Journal of Biochemistry & review*. 2017;17(4):1-7.
6. Susman IE, Schimbator M, Culetu A, Popa ME. Formulation of gluten-free cookies with enhanced quality and nutritional value. *Bulletin of University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca. Food Science and Technology*. 2021;78(1):113.
7. Lewis J. Codex nutrient reference values. Rome. FAO and WHO; c2019.