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DEVELOPMENT OF HUMM BISCUITS: A SUBSTITUTE FOR MAIDA-BASED BISCUITS FOR OVERWEIGHT YOUNG ADULT

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Abstract: Biscuits and cookies are popular across all age groups that comprises threebasic ingredients: flour, sugar, and fat, which are combined with additional minor ingredients to produce dough. Wheat flour has a high starch level but a low fibre and mineral content, resulting in biscuits with a lower protein and mineral content. Oats (Avena sativa) is a wonderful source of carbohydrate and protein with a favorable amino acid balance. Oats have a significant amount of lipids,particularly unsaturated fatty acids, minerals, vitamins, and phytochemicals. Oats haveseveral health benefits, including hypercholesterolemia and anticancer properties. Chickpea is also a good source of protein, carbohydrate, minerals and vitamins, and dietary fibre and its consumption has been associated with a lower risk of numerous chronic diseases like cardiovascular disease, obesity, cancer, and diabetes. **Aim**-To develop a healthy substitute for regular Maida-based biscuits by utilizing oats flour and chickpea hummus as a core component in the form of biscuits (Humm Biscuits) making it a healthy snack option. **Methods**-Oats flour and chickpea hummus dough was prepared along with the addition of sesame seeds, oil, and spices in the mixture. The dough was rolled to give the shape of biscuits and then baked. Once the product was developed it was assessed through sensory evaluation by using a scorecard. **Results andDiscussion**- The biscuits were crispy, had a nice greenish-brown colour and taste was similar to commercial 50-50 biscuits. **Conclusion**-The product is a good substitute for Regular Maida-based biscuits. Hummus biscuits are nutrient dense and can be consumed by all age groups as a healthy snack option. Along with being good protein and fibre source, it is also gluten-free.

Keywords-Biscuits, chickpea, hummus, oat flour, protein, health benefits

I. INTRODUCTION

Biscuits and cookies are popular among people of all ages, especially children, and dueto their variety of taste, texture, and odour, they hold a significant place among the various bakery items. Biscuits are typically made with three primary ingredients: flour,sugar, and fat, which are combined with additional minor ingredients to produce dough.Biscuits are low moisture content foods that have a long shelf life. A high fat content contributes to the product's desired texture and flavor. Because of its gluten concentration, wheat flour is the primary

ingredient in the manufacture of biscuits. Wheat flour, on the other hand, has a high starch level but a low fibre and mineral content, resulting in biscuits with reduced protein and mineral content. As a result, theremust be improved baked products to achieve a good quality nutrition.
Demand for healthy products including fibre and protein has increased to combat health issues such as high blood pressure, diabetes, colon cancer, and others. (Khalil et al., 2015), (Bolarinwa et al., 2016)

Oats (Avena sativa) have a well-balanced nutritional profile. It is a good source of carbohydrate and quality protein with a good amino acid balance. Oat includes a significant amount of oat lipids, including unsaturated fatty acids, minerals, vitamins, and phytochemicals.The most essential feature of Oat flour is its high fibre content, particularly β-glucan, which lowers cholesterol levels in the blood through increasing bile secretion in the body. Oats have several health benefits, including hypocholesterolemic and anticancercharacteristics. Oats have just been approved for use in the diets of celiac sufferers. Many studies have suggested utilizing oat flour as a source of dietary fiber in foods suchas bread and biscuits. (Rasane et al., 2015), (El-Qatey, Gadallah, & Shabib 2018).

Chickpeas (Cicer arietinum L.), often known as garbanzo beans, are an ancient world Pulse (i.e., edible seeds) in the legume family that has traditionally been included numerous culinary creations due to its nut-like flavor and versatile sensory applications in food. (Wallace, Murray & Zelman, 2016). Chickpea is also an affordable and good source of high protein, carbohydrate, minerals and vitamins, dietary fibre, and folate. It also has high antioxidant action. Scientific data supports the possible beneficial effects of Chickpea componentson the risk of several chronic diseases like cardiovascular disease, obesity, cancer, anddiabetes. Chickpeas are high in isoflavones, which have been linked to a lower risk of breast cancer, prostate cancer, and cardiovascular disease. (Soni, Kulkarni & Patel, 2018).

Traditional hummus is made with a particular combination of chickpeas, tahini, olive oil, lemon juice, and spices, which may provide extra benefits in addition to meeting nutritional needs. Research supports the use of hummus/chickpeas in terms of weight control, glucose and insulin response, cardiovascular disease, cancer, and/or GI health. (Wallace, Murray & Zelman, 2016)

Therefore, the study aimed to improve the nutritional quality of biscuits by replacing wheat flour with oat flour & chickpea hummus which are naturally good sources of protein and fibre.

II. MATERIALS AND METHODS

A food product was supposed to be designed as a part of the post-graduation practical.An innovative food product was thought of which would be a healthy substitute for regular Maida-based biscuits by using oats flour and chickpea hummus as main ingredients. They were utilized in the form of biscuits (Humm Biscuits) making it a healthy snack option. It was made in such a way that it can be consumed by all age groups. The raw materials with the amounts are presented in the table 1.1.

Table 1.1: Raw materials and ingredients

Ingredients	Amount
Oats flour	30g
Chickpea hummus	30g
Sesame seeds	15g
Oil	15g
Chilli powder	1 tsp

2.1 Procedure

Following are the steps and cooking methods used respectively -

1. *Preparation for the hummus: Soaking and Sprouting*

The 30g chickpeas were soaked overnight (6-8 hours). After keeping for a few more hours the chickpeas sprouted. Using these sprouted chickpeas increased the overall nutritional value of the product.

2. *Preparation of the grinded ingredients: Roasting and Grinding*

Rolled oats were roasted and ground into fine flour and kept separate. The sprouted chickpeas were ground into a thick hummus. Roast sesame seeds and grind them in a mixer grinder. Later add oil and one garlic clove (negligible) to make tahini. Add this to the hummus.

1. *Mixing of ingredients: Chopping and mixing*

Now in a mixing bowl, add the grinded oats flour. Along with it add chopped mint leaves, salt and ½ tsp chilli powder. Now add the hummus into the mixing bowl and mix well. Keep adding oats flour. It requires a lot of water to make the dough. Add 1 tbsp of powdered sugar for a nice sweet taste.

2. *Preparation of equal sized biscuits: Rolling and Cutting*

Roll out the dough over a butter paper using a rolling pin. Sprinkle sesame seeds over the rolled dough and roll it again for seeds to set. Now cut into equal square shapes andprick it with a fork to remote air bubbles.

3. *Final Execution: Baking and Plating*

Now place the biscuits over a baking tray. Place the tray into the microwave at 350 degrees Celsius for 25- 30 minutes. Check after 20 minutes and accordingly increase or decrease base temperature. Once baked, let the biscuits cool for some time to get crispier.

Humm biscuits are ready to served.

2.2 Evaluation and Analysis Methods

Sensory Evaluation

Sensory Evaluation was carried out where attributes such as appearance/ colour, taste, aroma, texture, overall acceptability, and innovation was evaluated by a trio of panelists.The average of these attributes was taken to formulate a result. Trials of other productslike Rajgira biscuits and Moringa Bites were done but they weren't chosen for further development due to their taste and appearance respectively. In the end, Humm Biscuitswere finalized due to its overall benefits.

Microbial analysis

Microbial analysis of the product was conducted where the pour plate method was used.This technique was used to count the no. of microorganisms in a mixed sample, whichwas added to a molten agar medium prior to its solidification. Molten agar was cooled at 44 degrees Celsius before plating as it may lead to death of desired organisms if not done correctly. The process resulted in colonies uniformly throughout the solid mediumwhen the appropriate sample dilution was plated. Three repetitive microscopic findingswere carried out. The materials used were sample, sterilized petri-plate, sterilizednutrient medium, flame and glass marker.

Shelf life -The shelf life of the product was 30 days.

III. RESULTS AND DISSCUSSIONS

3.1 Sensory Evaluation Analysis

The data collected was tabulated and analyzed statistically. The results from the analysis are presented and discussed in the following sequence.

The Humm Biscuits prepared by incorporating oats flour and chickpea hummus in the ratio 1:1 was subjected to sensory evaluation by 3 panelists using Scoring Scale.

Table 1.2: Sensory Evaluation of Humm Biscuit Product
Sensory Evaluation [out of 5]

Panelist	Appearance/colour	Taste	Aroma	Texture	Overall Acceptability	Innovation
1	3	3	3	3	3	3
2	3	3.5	2.5	3	2.5	3
3	3	3	3	2.5	3	3
Average	**3**	**3.16**	**2.8**	**2.8**	**2.8**	**3**

The following table 1.2. shows that Taste received the average score of 3.16, Appearance /colour and Innovation received scores 3 while the Aroma, Texture and overall acceptability received 2.8 each.

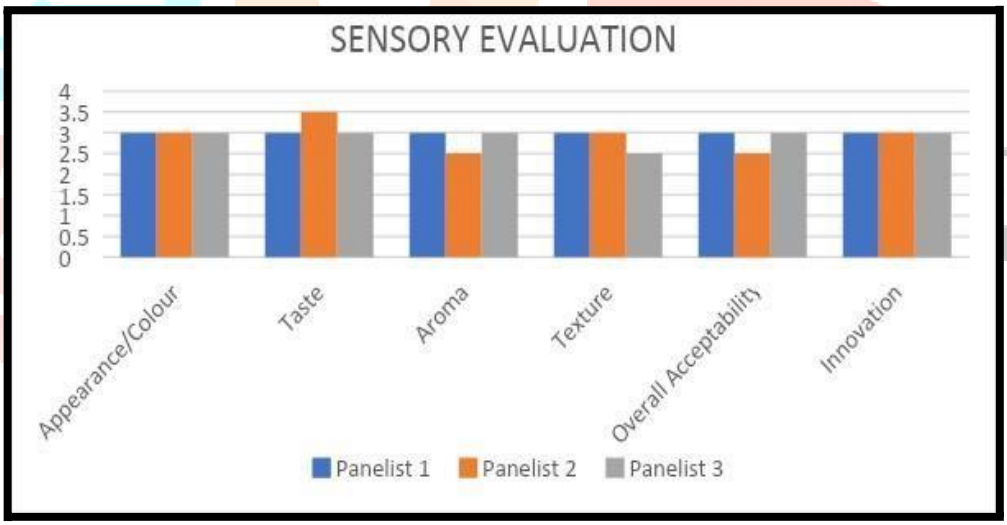

Fig.1.1.Graphical Representation of Sensory Evaluation of Humm Biscuits

Table 1.3: Nutritional Value

Ingredients	Amount (ml/tsp/g)	Energy (kcal)	CHO (g)	Proteins(g)	Fats(g)	Fibre(g)
Oats flour	30	112	18	4	2	1.05
Chickpea hummus	30	86	12	5.6	1.5	7.57
Sesame seeds	15	77	1.6	3	6	2.55
oil	15	135	-	-	15	0
	Total =	**449 kcal**	**32g**	**12.6g**	**24.5g**	**11.17**

Total no. of biscuits prepared 10, cooked weight = 50 gm

1 serving =5 biscuits (Weight: - 25 g)

Energy=225 kcal, CHO= 16 g, Proteins= 6.3 g, Fats= 12.25 g Fibre = 5.58 g

From the following table 1.3. the total protein content of biscuits was 12.6 gm and fibre was 11.17 gm. The maximum protein was contributed by chickpea hummus followed by oats flour as they are good sources of complete protein. Oats and chickpea both being agood source of soluble fibre enhances the nutritional value of the product. Andtherefore, the Humm Biscuits can be a good substitute for Regular biscuits made with refined flour. Various studies have reported that soluble fibre promotes satiety by reducing appetite.

3.2 Pour Plate Method Analysis

For the microbial count, the pour plate method was used to find the microbialcolonies. After 3 repetitive microscopic findings, the readings are presented in the table 1.4. below.

Table 1.4: Microscopic findings

Microscopic Findings	Microbial Count of colonies
1.	20 cfu/ml
2.	10 cfu/ml
3.	30 cfu/ml

IV. CONCLUSION

Biscuits are typically made with three primary ingredients: flour, sugar, and fat which are usually low in nutrient content. To make good protein content biscuits these ingredients can be replaced by good protein sources. Oat flour and chickpeas are identified to be good protein substitutes for preparing biscuits. Also adding high fibre to theproduct. Humm biscuits with a 1:1 ratio of oats and chickpeas were developed. The sensory and microbial analysis was conducted and based on the results this product canbe preferred as a good substitute for Maida-based biscuits.

V. REFERENCES

Bajpai, V., Shukla, P., & Shukla, R. N. (2018). Development and Quality Evaluation ofOat-Fortified Cake Rusk. Indian Journal of Nutrition, 5(1), 179-183.

Bolarinwa, I. F., Abioye, A. O., Adeyanju, J. A., & Kareem, Z. O. (2016). Production and qualityevaluation of biscuits produced from malted sorghum-soy flour blends. Journal of Advances in Food Science and Technology, 3(3), 107-113.

El-Qatey, W. A., Gadallah, M. G. E., & Shabib, Z. A. (2018). Enhancement of nutritional value, quality, and sensory properties of biscuit by incorporating oat flour. J Agric. Vet. Sci., Qassim University, 11(2), 13-224.

Khalil, A. W., Ali, J., Masood, T., Arif, M., Parvez, M., & Hassan, S. (2015). Effect of oat branon the quality of enriched high fiber biscuits. World Journal of Dairy & Food Sciences, 10(1),68-73.

Rasane, P., Jha, A., Sabikhi, L., Kumar, A., & Unnikrishnan, V. S. (2015). Nutritional advantages of oatsand opportunities for its processing as value added foods-a review. *Journal of food science and technology*, *52*(2), 662-675.

Soni, N., Kulkarni, A. S., & Patel, L. (2018). Studies on development of high protein cookies. *Int. J. Chem. Stud*, *6*, 439-444.

Wallace, T. C., Murray, R., & Zelman, K. M. (2016). The nutritional value and health benefits ofchickpeas and hummus. *Nutrients*, *8*(12), 766.

Tables –