Research Article

"DEVELOPMENT OF HIGH FIBRE CAKE USING GRAM FLOUR"

[1]Tanya Singh and [2]*Neha Chaudhary

[1]Department of Food Technology, BFIT Institute of Technology, Dehradun India
[2]Assistant Professor, Department of Food Technology, BFIT Institute of Technology, Dehradun India

ARTICLE INFO	ABSTRACT
	The study shows the preparation of dietary fiber cake comprising of wheat flour which is extremely important as it takes an important place among the few crop species being extensively grown as staple food and chickpea flour which is a good source of minerals, protein and trace elements which lowers the cost and improve the quality of cake in terms of consumer acceptability. Various ratios of wheat flour and chickpea flour were taken out of which the ratio which gain maximum acceptability level on the basis of sensory evaluation was 62:38. The standardization of the product was done on the basis organoleptic property which gives approx 25 different ratio of the product followed by the sensory evaluation to get the final ratio.

INTRODUCTION

Cake- Cakes are popular and are associated in the consumer's mind with a delicious sponge product with desired organoleptic characteristic (Matsakidor *et al.*, 2010). Cake quality is determined by three major factors: the appropriates of ingredients for the specific type of cake being made a properly balanced formula and the optimum mixing and baking process (Cauvain and young 2006). Starch gelatinization and protein denaturation together with carbon-di-oxide with a fine homogenous moist crumb (Sahi *et al.* 2003; Cauvain and young 2006). Cake flour is low ash and low protein content produced for best cake quality by milling technology of soft as well as hard wheat that is free of bran & wheat germ. Soft wheat flour are usually weak flour and low in water absorption (Edmund *et al.*2008; Al-Dmoor, 2012). The best cakes are obtained from a low-protein flour (7-9%) to give soft cakes. The general composition for typical cake flour are water 14.5%, proteins 7 – 8%, starch 72 – 74%, sugars 1 – 2 % lipids 0.4 - 0.6 % cellulose 0.1 % and minerals 0.2 - 0.5%. Extraction rate for cake flour production is 50 % mostly are applied in flour milling (Edmund *et al.*, 2008; AlDmoor, 2012).

*Corresponding author: Neha Chaudhary,
Assistnat professor, Department of Food Technology, BFIT Institute of Technology, Dehradun India.

Wheat Flour: Not only wheat flour but also other flour types have been investigating for developing cakes of lower cost & better quality in terms of consumer acceptance (Turbai *et al.*). The nutrition value of wheat is extremely important as it takes an important place among the few crop species being extensively grown as staple food (Lindsay 2002, Welch and Graham 2002). They have no enzyme activity, but they have a function in the formation of dough as they retain gas, producing spongy baked products (Belderok et.al 2000). Wheat flour approximately consists of 72% carbohydrate, 8 to 13% moisture, 2.5% sugar and 1.5% fat, 1.0% soluble protein and 0.5% minerals salt (Oberoi *et al.*, 2007). Wheat also lowers the level of esterogen in the blood which reduces the risk of breast and prostate cancers (John *et al.*2006). Enhancing substances (e.g. ascorbic acid, S-containing amino acids, etc) that promote micronutrient bioavailability or decreasing antinutrient substances (e.g. phytate, polyphenolics, etc) that inhibit micronutrient bioavailability, are both options that could be pursued in breeding programs (Welch 2002; Welch and Graham 2004; Welch 2005).

Chickpea Flour: Regular consumption of pulses may have important protective effects on risk for cardiovascular disease (Anderson & Major 2002). Moreover; pulses contain a rich variety of compounds, which if consumed in sufficient quantities, may help to reduce tumour risk (Mathers, 2002).

Chickpea is a good source of minerals, protein and trace elements. Legumes contain almost 2 times more protein and minerals & 3 times more in dietary fiber that wheat flour (Sath *et al.*, 1984). Legume proteins are rich in lysine which is an important essential amino acid limited in cereals grains (Muller 1983). In chickpea, the main limiting amino acids are methionine and cystine, followed by valine and then tryptophan. Chickpea protein isolates, prepared on a bench scale, have been shown to have good nutritional properties when supplemented with methionine or mixed with cereals. Studies have shown that chickpea our can be successfully incorporated into products at up to 20% inclusion, to produce products that rate higher in terms of color, texture, taste and overall acceptability (Knorr and Betschart, 1978; Bloksma and Bushuk, 1988).

Objective: Keeping in view, the above fact, the present work dealt with the following objectives

- To study the physico -chemical composition of raw material such as wheat flour and gram flour.
- To study the standardization process involve in the development of cake.

Physico-Chemical composition of gram flour and wheat flour

Chemical composition	Gram flour	Wheat flour
Carbohydrate(g)	57	72.57
Fat(g)	6	1.87
Crude Protein(%)	21.9	8.9
Moisture (%)	8.9	12.7
Ash (%)	3.24	0.67
Crude fibre(%)	9.9	0.6
Total lipids(%)	6.3	1.8

Source: Simona MAN *et al.* (2015)

MATERIALS AND METHODS

Wheat flour, chickpea flour, egg, butter and sugar were procured from the local market of Dehradun.

Raw material
(Wheat flour, chickpea flour, egg, butter, sugar)
↓
Sieving of flour
↓
Weighing of raw material
↓
Preheating of Oven (200^{0}C for 20 min)
↓
Beating of sugar and melted butter
↓
Addition of egg
↓
Beating (10 min)
↓
Addition of wheat flour and chickpea flour
↓
Beating (10 min)
↓
Greasing of baking mould
↓
Pouring of cake batter
↓
Settling of batter
↓
Baking (150-180 for 20 min)
↓
Cake
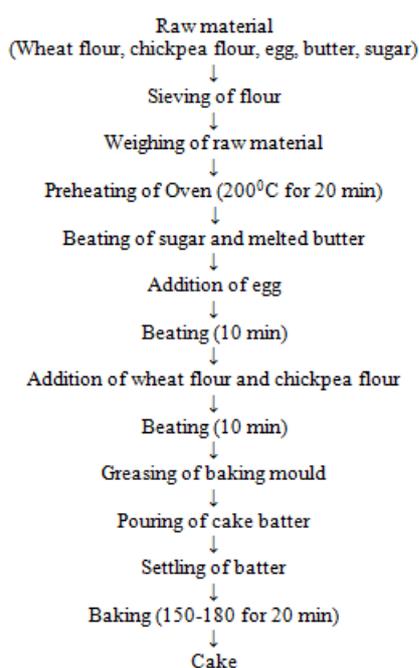
Fig. 1. flow chart showing preparation of Cake

Figure 2.

Preparation of cake

Wheat flour, chickpea flour, eggs, butter and sugar were bought from the local market of Dehradun. All the raw material was properly measured according to the ratio required in cake. The wheat flour and chickpea flour were sieved through fine sieves to avoid the dirt and unwanted particles. Meanwhile the oven is preheated at 200^{0}C for 20 min. The weighed sugar and melted butter were beaten properly using beater for 10 min. The egg white as well as egg yolk was added and properly beaten using beater for 10min. It was further processed by addition of weighed wheat flour , chickpea flour and baking powder and again proper beating was done for 10 min. The batter obtained was poured in greased baking mould and even settling was done using spreader. After the settling of batter it was baked in preheated oven at 150-180^{0}C for 20 min.

Colour

The overall acceptability obtained for the parameter was 6.8 which was more than the acceptability level that is 5. The acceptability was obtained by sensory evaluation done by 10 semi trained penalists on the basis of 9 point hedonic scale.

Texture

The overall acceptability obtained for the parameter was 6.85 which was more than the acceptability level that is 5. The acceptability was obtained by sensory evaluation done by 10 semi trained penalists on the basis of 9 point hedonic scale.

Flavor

The overall acceptability obtained for the parameter was 6.65 which was more than the acceptability level that is 5. The acceptability was obtained by sensory evaluation done by 10 semi trained penalists on the basis of 9 point hedonic scale.

Taste

The overall acceptability obtained for the parameter was 7.0 which was more than the acceptability level that is 5. The acceptability was obtained by sensory evaluation done by 10 semi trained penalists on the basis of 9 point hedonic scale.

Sensory Evaluation: 9 point hedonic scale

Parameter	Panelist1	Panelist2	Panelist3	Panelist4	Panelist5	Panelist6	Panelist7	Panelist8	Panelist9	Panelist10	Overall acceptability
Colour	5	7	7	7	7	7	6	7	8	7	6.8
Texture	5.5	8	8	8	6	6	5	6	8	8	6.85
Flavour	5.5	8	8	7	6	7	5	6	7	7	6.65
Taste	6	8	8	8	7	6	5	6	8	8	7
Overall acceptability	6.25	7.75	7.75	7.5	6.5	6.5	5.25	6.25	7.75	7.5	-

REFERENCES

Aqeel Hasan Rizvi1, Vipin Kumar Dwivedi, Raj Kumar Sairam3, Shyam Singh Yadav, Chellapilla Bharadwaj, Ashutosh Sarker, Afroz Alam, 2014. International Center for Agricultural Research in the Dry Areas, South Asia & China Regional Program, NASC Complex,new delhi *International Journal of Scientific Research in Agricultural Sciences,* 1(2), pp. 23-31,

Busarawan Chaiya and Rungnaphar Pongsawatmanit, 2011. Department of Product Development, Faculty of Agro-Industry, Kasetsart University, Bangkok 10900, Thailand. Kasetsart *J. (Nat. Sci.)* 45 : 305 - 313

Department of Agricultural Engineering and Food Technology, S.V. Patel University of Agriculture and Technology, Modipuram, Meerut (UP) - India. Vol. 8(38), pp. 4849-4852, 3 October, 2013 DOI:10.5897/AJAR2013.6905 ISSN 1991-637X ©2013 *Academic Journals*

Hanee M. Al-Dmoor 2013. Department of Nutrition and Food Processing, Faculty of Agricultural Technology, Al-Balqa *Applied University, Al-Salt, Jordan European Scientific Journal* January 2013 edition vol.9, No.3 ISSN: 1857 – 7881 (Print) e - ISSN 1857- 7431

Hefnawy, T. M. H., El-Shourbagy, G. A. and Ramadan, M. F. 2012. Biochemistry Department, 2Food Science Department, Faculty of Agriculture, Zagazig University, Zagazig 44519, *Egypt International Food Research Journal* 19(2): 521-525

Ines, C. Gonzales, Hilda L. Quindara, Fernando R. Gonzales and Esther T. 2014. Botangen *International Journal of Scientific & Engineering Research,* Volume 5, Issue 4, April-2014 193 ISSN 2229-5518

Julia RodRíguez-gaRcía, ana Puig , ana SalvadoR and isabel HeRnando 2013. department of Food Technology, Research group of Food Microstructure and chemistry, universitat Politècnica de valència, valencia, Spain; 2department of Food Preservation and Quality, institute of agrochemistry and Food Technology (cSic), Burjassot, SpainBox 73, 46100 Burjassot, Valencia, Spain. *Czech J. Food Sci.* Vol. 31, 2013, No. 4: 355–360

Manuel Gómez, Bonastre Oliete, Cristina M. Rosell, Valentín Pando, Encarnación Fernández Departamento de Ingeniería Agrícola y Forestal, Tecnología de los Alimentos, E.T.S.Ingenierías Agrarias, 2016. Universidad de Valladolid, 34004 Palencia, Spain. 2 Cereals Group, Instituto de Agroquímicay Tecnología de Alimentos, CSIC, P.O. *9 Cristina M Rosell Retrieved* on: 29 March 2016

Zuzana Šramkováa, Edita Gregováb, Ernest Šturdíka, 2009. Institute of Biochemistry, Nutrition and Health Protection, Slovak University of Technology Radlinského 9, 812 37 Bratislava, Slovak Republic b) Research Institute of Plant Production, Slovak Centre of Agricultural Research, Bratislavská 122, 921 68 Piešťany, Slovak Republic Acta Chimica Slovaca, Vol.2, No.1, 115 – 138

****