



E-ISSN: 2709-9385
P-ISSN: 2709-9377
JCRFS 2021; 2(2): 118-120
© 2021 JCRFS
www.foodresearchjournal.com
Received: 06-11-2021
Accepted: 15-12-2021

Rita Mondal

1. SACT, Department of Nutrition, Mahishadal Raj College, West Bengal, India
2. Ph.D. Scholar, Department of Home Science, CMJ University, Meghalaya, India

Souvik Tewari

Assistant Professor,
Department of Food and Nutrition, Swami Vivekananda University, Barrackpore, West Bengal, India

Moumita Das

SACT, Department of Nutrition, Mahishadal Raj College & PhD Scholar, Dept. of Home Science, CMJ University, Meghalaya, India

Ranajit Kumar Khalua

Vice Principal & Associate Professor, Narajole Raj College and Faculty, CMJ University, Meghalaya, India

Corresponding Author:

Ranajit Kumar Khalua

Vice Principal & Associate Professor, Narajole Raj College and Faculty, CMJ University, Meghalaya, India

Improved nutritional value and health benefits of biscuits: A systematic review

Rita Mondal, Souvik Tewari, Moumita Das and Ranajit Kumar Khalua

Abstract

Biscuits are ready-to-eat foods. It has high amount of fat & surrounding environmental conditions may hamper the quality of biscuits. Technology for biscuits has recently advanced quickly in order to enhance their nutritious qualities. In modern days, standard of living is very much escalated. Among baked food items, development of biscuits has rapidly increased. Day by day, biscuit industry is very much enlarged from medium to high scale. The objective of this review article is to know about the numerous biscuit varieties that have been created utilising a variety of ingredients to improve their efficiency and nutritional worth.

Keywords: Antioxidant, bakery products, biscuit, dietary fibre, functional foods, medicinal plant

Introduction

The nutritional value of bakery goods and their potential for use in feeding programmes and emergencies captured the attention of customers. An understanding of the research efforts used to study bread products can be gained from a wealth of research on cereal science and technology. Due to a variety of characteristics, biscuits stand out among baked goods made from grain. The production of biscuits has developed from a Labor-intensive craft to a highly automated science. Biscuits are used as dietary supplements, luxury presents, snacks, baby feeds, and dog and cat food (Arepally *et al.*, 2020) [2].

In 19th century, European is habituated with a famous food which has less moisture, easily stored, & also fulfil hunger, this is none other than 'Biscuits'. The word Biscuit is derived from Latin word 'Panis biscotus'; that means two times cooked bread construct for sailors & it is known as 'Marine biscuits'. The definition of biscuit is 'hard dry bread that transported to sea' by Dr. Samuel Johnson. British first made this kind of biscuits name as crackers, wafers, cookies (Manley, 2011) [9].

Krystyan *et al.* (2015) [12] noted that biscuits are very much used as popular snacks that is very much simple for intake. It has prolonged shelf life. These foods are mostly sweet their fore sugar have to be modified according to dietary parameter.

It has high amount of fat & surrounding environmental conditions may hamper the quality of biscuits. Ambient conditions are oxidation, in that hydroperoxides are generated which is caused quantity of secondary reaction along with aldehyde, ketone, acids & another volatile compounds, therefore fallen down the quality, flavour, colour & gathering some toxic compounds which shows great problem in food sector (Priego-López *et al.*, 2003) [11].

Arepally *et al.* (2020) [2] reported that due to their nutritional value and viability for use in feeding programmes and emergency scenarios like earthquakes, interest in bread products is increasing daily. An understanding of the research efforts used to study bread products can be gained from a wealth of research on cereal science and technology. Due to its appealing qualities, such as a longer shelf life, a variety of tastes and textures, as well as widespread consumption, biscuits hold a remarkable position among bakery items as a flexible snack.

Makpoul & Ibrahim (2015) [8] found that the production of biscuits is no longer regarded as a craft but as a fully developed technology that was created after the numerous processes were well understood with the aid of fundamental scientific and engineering principles. New, highly productive automatic machines have replaced outdated manufacturing equipment all across the world. Some foreign nations have computerised the production of biscuits. All branded cookie production in India is extensively subsidised by their franchise units, including Britannia, Parley, Sun Feast, and others. These biscuits are in extremely high demand. The biscuit is the most popular processed good consumed in India, regardless of whether it is consumed in a rural or urban region.

In modern days, standard of living is very much escalated. Among baked food items, development of biscuits has rapidly increased. Day by day, biscuit industry is very much enlarged from medium to high scale (Zheng, 2020) ^[13]. The consumption of biscuits annually in United states, Britain, Western European countries is more than 10kg according to literature review. Whereas South East Asian countries biscuit consumption is more than 4.25 kg. The per capita consumption of biscuits annually in Japan is 7.5 kg & in China, consumption rate is less than 2 kg (Ahmad & Ahmad, 2014) ^[14].

The purpose of this review article is to inform researchers about the various types of biscuits that have been developed using diverse ingredients to enhance their nutritional value and efficiency.

Improvement of nutritional value of biscuits by using different functional foods

Biscuit is the member of convenience food that is present in baked food item. Moreover, biscuit is the crispy food item which has less than 6% moisture that is developed from gluten of wheat flour along with additional compounds like sugar (present or not), oil & another filling compounds by blending, moulding, baking & other food processing procedures. In vast technology decades varieties, taste & other organoleptic features of biscuits are different. With comparison of other snack food items, biscuits have minimal processing charges, easily transported, easily consumed, & have lingered shelf life (Hooda & Jood, 2005) ^[4].

Korus *et al.* (2017) ^[7] concluded that acorn flour added to biscuits did not significantly change the protein amount when compared to the control biscuits, whereas hemp flour added to biscuits increased the protein content by 40–122%. With the inclusion of the examined flours, the overall dietary fibre level rose in line. In comparison to the control, the total polyphenol content (TPC) of biscuits increased between 308 and 801% with the addition of acorn flour and between 41 and 143% with the addition of hemp flour. The antioxidant activity of the biscuits grew more rapidly (on average, by 367%) when acorn flour was used compared to control samples than hemp flour (On average, by 114%).

Biscuit contains various constituents like flour, fat/oil, sugar, water along with some main constituents are also used to develop biscuits like salt, egg, emulsifier, starter such as sodium bicarbonate, ammonium bicarbonate, milk powder, seasoning constituents. Ingredients are very much altered in different type of biscuits. Complex & heterogenous dough like wheat flour dough consist flour, sugar, fat they possess texture, colour, flavour (Pareyt & Delcour, 2008) ^[10].

Kārklīņa *et al.* (2012) ^[6] reported that the physical-chemical characteristics of biscuits were significantly impacted by the inclusion of Jerusalem artichoke powder (JAP) and Cocoa Beans Shell (CBS) powder during biscuit production. The nutritional value of biscuits containing Jerusalem artichoke and CBS powder rose as a result of the increased dietary fibre content. According to the study, JAP and CBS can be effectively mixed into biscuit dough. According to the study, typical high-fat and high-sugar biscuits, which the majority of customers do not identify with a healthy diet, can be altered to generate a healthier alternative.

Aly *et al.* (2021) ^[1] noted that whole barley flour was found to add more nutritional value to wheat-based bakery goods

by increasing their fibre, ash, and antioxidant content, all of which may have an impact on people's health. In this way, we may maximise the potential growth of barley as a functional food. Additionally, supplementation reduced the microbial burden over the course of storage. Additionally, by including more barley in wheat products, the food gap caused by insufficient wheat output can be filled without the need to import wheat from other nations.

A few elements, including proteins, dietary fibre, minerals, and essential amino acids (EAA), seem to be abundant in lima beans. Phytic acid, tannins, and trypsin inhibitors, on the other hand, were anti-nutritional elements in lima beans and were largely or completely destroyed by standard processing techniques (heating, soaking, roasting, and dehulling). By combining 30% lima bean powder with 70% wheat flour at 72% extraction rate, high-quality biscuits with acceptable sensory, physical, chemical, and nutritional qualities can be made. The protein, dietary fibre, minerals, and EAA content of the biscuits had significantly improved, and in most cases, the limitations met the FAO/WHO recommendations. As a result, it is suggested that adding Lima beans to wheat flour may improve the nutritious value of the biscuits and lessen their reliance on wheat flour (El-Gohery, 2021) ^[3].

The fish protein concentrate (FPC) prepared from by-products of tilapia was very nutritious. It is regarded as a remedy for the issue of disposing of fish waste and as an ingredient that may be used in various recipes, such as salt biscuits (Ibrahim, 2009) ^[5].

Conclusion

The scientific data on biscuit nutrition and its relationship to human health are highlighted in this review. The production of a wide range of biscuits in the form of foods high in necessary and/or useful nutrients is how the biscuit business hopes to promote human health. Products made from biscuits seem to be a great food transport matrix for the addition of a range of cutting-edge and nutritious components and offer a number of advantageous functional qualities. The raw materials utilised and the manufacturing method have a big impact on the physical, chemical, functional, and rheological qualities of these products. The interaction of biscuits' physical, chemical, functional, and rheological characteristics results in their functionality. Protein, fibre, and bioactive substances have increased, while the hydrolysis index, fat content, and sugar content have decreased, as a result of various treatments applied to biscuits that have improved their nutritional contents.

References

1. Aly AA, El-Deeb FE, Abdelazeem AA, Hameed AM, Alfi AA, Alessa H, *et al.* Addition of whole barley flour as a partial substitute of wheat flour to enhance the nutritional value of biscuits. *Arabian Journal of Chemistry*. 2021;14(5):103112.
2. Arepally D, Reddy RS, Goswami TK, Datta AK. Biscuit baking: A review. *Lwt*. 2020;131:109726.
3. El-Gohery SS. Effect of different treatments on nutritional value of lima bean (*Phaseolus lunatus*) and its utilization in biscuit manufacture. *Food and Nutrition Sciences*. 2021;12(4):372-391.
4. Hooda S, Jood S. Organoleptic and nutritional evaluation of wheat biscuits supplemented with

- untreated and treated fenugreek flour. Food chemistry. 2005;90(3):427-435.
5. Ibrahim SM. Evaluation of production and quality of salt-biscuits supplemented with fish protein concentrate. World Journal of Dairy and Food Sciences. 2009;4(1):28-31.
 6. Kārklīņa D, Gedrovica I, Reča M, Kronberga M. Production of biscuits with higher nutritional value. In Proceedings of the Latvian Academy of Sciences. Section B. Natural, Exact, and Applied Sciences. 2012;66(3):113-116.
 7. Korus A, Gumul D, Krystyan M, Juszcak L, Korus J. Evaluation of the quality, nutritional value and antioxidant activity of gluten-free biscuits made from corn-acorn flour or corn-hemp flour composites. European Food Research and Technology. 2017;243:1429-1438.
 8. Makpoul KR, Ibrahim AA. Improving biscuit nutritional value using quinoa flour. Journal of Food and Dairy Sciences. 2015;6(12):771-780.
 9. Manley D. Biscuit, cracker and cookie recipes for the food industry. Elsevier; c2001.
 10. Pareyt B, Delcour JA. The role of wheat flour constituents, sugar, and fat in low moisture cereal based products: a review on sugar-snap cookies. Critical reviews in food science and nutrition. 2008;48(9):824-839.
 11. Priego-López E, Velasco J, Dobarganes MC, Ramis-Ramos G, De Castro ML. Focused microwave-assisted Soxhlet extraction: An expeditive approach for the isolation of lipids from sausage products. Food chemistry. 2003;83(1):143-149.
 12. Krystyan M, Gumul D, Ziobro R, Korus A. The fortification of biscuits with bee pollen and its effect on physicochemical and antioxidant properties in biscuits. LWT-Food Science and Technology. 2015;63(1):640-646.
 13. Zheng B, Zhao H, Zhou Q, Cai J, Wang X, Cao W, *et al.* Relationships of protein composition, gluten structure, and dough rheological properties with short biscuits quality of soft wheat varieties. Agronomy Journal. 2020;112(3):1921-1930.
 14. Ahmad S, Ahmed M. A review on biscuit, a largest consumed processed product in India, its fortification and nutritional improvement. International Journal of Science Inventions Today. 2014;3(2):169-186.