MINI REVIEW

An overview on bakery and its products

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Scalett H. An overview on bakery and its products. J Food Drug Res. 2022;6(1):1-2.

ABSTRACT

Presently, the bakery sector is attempting to improve the health qualities of its products by using functional ingredients that can contribute to healthier food items in some form. The functional foods industry has grown due to consumer desire for healthier food products that prevent nutrition-related disorders and promote physical and mental well-being. Beverages, dairy products, confectionary items, bread products, and morning cereals are the five key sectors for functional foods. Functional foods are being developed in the fields of gastrointestinal health and immunity, cardiovascular disease and cancer prevention, weight control, insulin sensitivity and diabetes control, and mental and physical efficiency.

Key Words: *Functional foods; Bakery products; Nutritive qualities*

INTRODUCTION

Foods of exceptional quality or nutritional worth, as well as minimally processed foods that keep the fresh product's characteristics, are in high demand. Food products undergo changes during storage, resulting in quality issues ranging from slight sensory flaws to complete spoiling. Food packaging can have a significant impact on its shelf life, which is defined as the amount of time that quality losses do not exceed an acceptable threshold [1].

Bakery products range in complexity and include foods like bread, cakes, and biscuits (crackers and cookies), all of which use wheat flour as a primary component to provide bulk and structure. Bakery items are commonly eaten on a regular basis and play a vital part in human nutrition. Because of their ability to minimize the risk of chronic diseases beyond basic nutritional requirements, multifunctional ingredients have become increasingly popular in bread products. Food industrial By-Products (BP) are a great source of useful components like fiber, minerals, and phytonutrients. Possible usage for those BP is a hot topic right now. Despite this, they often have low biological stability, high water content, and strong enzymatic activity. As a result, possible functional components must be extracted or refined reprocessed in bread products. Peel, stem, leaf, seed, shell, bran, kernel, pomace, oil cake, and other food industrial BP elements include: peel, stem, leaf, seed, shell, bran, kernel, pomace, oil cake, and so on [2]. Bakery items, notably bread, have a long and illustrious history. Baking may well have begun as early as 23,000 years ago even during Paleolithic Period, according to evidence from the most recent archaeological discoveries. People found wheat at that time and learned to blend wheat grain meal with water and bake it on fire-heated stones. Humans created the first flat bread as a result of this. Yeast was utilized by ancient Egyptians to produce fermented bread between 2600 BC and 3000 BC. Because of the expensive cost of milling, most people ate whole wheat and whole grain bread. White bread was also accessible, but only to wealthy individuals. White bread has become a staple as a whole since the 1900s. Bakery products these days vary in severity from the basic ingredients of a plain pastry to the many elements that make up a cake. The evolution of baked goods from their original simple and plain appearances to contemporary variety with specific features and capabilities made possible by advanced manufacturing technologies has paralleled advances in many related sectors of science and technology [3]. Baking products is a sort of "art," because the technological process cannot be reduced to a series of activities performed under specific circumstances. Wheat flour is the primary raw material for these delicacies, and each technological procedure must be completed in order to fully use each type of flour's qualities. This is true of many Italian baked goods, which use not only wheat flour but also other sources of starch in their formulation. Previously, the decision was based on the superior adaptability of specific cereals and non-cereals, comparison to conventional wheat, to the unique pedoclimatic and agronomic circumstances of various Italian regions [4]. The most prevalent spoilers in baked products are fungi. When they are not maintained, they typically have a shelf life of 34 days. Fungi are accountable for the generation of off flavors as well as the production of mycotoxins and allergic substances, in addition to the repulsive sight of prospect of improvement. In recent years, use of mild organic acids such as propionic, benzoic, and sorbic, as well as research into packing materials and changed environment packaging, have been the primary methods for meeting market needs to prolong the shelf-life of bakery items. Consumers nowadays choose items that do not include preservatives but are free of microbiological growth, toxins, and other quality-degrading agents, preserving freshness and sensory attributes. As a result, the food industry's task is to meet these objectives with minimal compromise in food quality and maximum security while avoiding the use of synthetic chemicals [5]. Active packaging is a fascinating replacement to both stabilizers and MAP (modified atmosphere packaging). It entails the use of agents in the packaging that can interact directly with the packaged food or with the environment inside the box. One of the most difficult research projects nowadays is the production of electrode material with qualities that improve the shelf-life and safety of packaged foods. There have been several ways proposed, but only a few are becoming widely viable [6].

Bakery product categorization

Bakery items come in a wide range of sizes, shapes, colors, textures, tastes, and flavor's, and can be classified by their formula (primarily sugar amount or leavening type), pH level and moisture content, or water holding capacity. Unsweetened, sweet goods, filled goods, leavened with yeast or chemical agents, unleavened products, high acid, low acid and nonacid or alkaline bakery products all are the examples of different type of bakery products [7].

Raw material for bread and bakery items: Wheat

The selection of components is critical for producing a leavened product that meets the expectations of the client. Wheat's capacity to generate viscoelastic dough is one of its distinguishing characteristics. Wheat dough, in another terms, has distinct and specific rheological qualities that allow it to be stretched and distorted without fracturing, as will be detailed later. Simultaneously while, the dough is elastic and tenacious, capable of holding its form also when put under physical strain. Gluten proteins lose their viscosity after baking, ensuring that the final shape is maintained. The unusual and diverse behavior of wheat is not attributable to quantitative differences. In truth, the protein content of various wheat cultivars varies greatly, ranging from 9% to 16% of the total grain weight [8].

Structure and composition of wheat grains

The wheat grain or kernel-botanically known as caryopsis-is a unique dry fruit that does not open at maturity and has three distinct sections. The fruit coat (or pericarp) surrounds and protects both the embryo, or germ-the life-giving element of the seed-and the endosperm, the bigger part of the kernel, on the exterior, by being adjacent and strongly attached to the seed coat. Starch and

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Received: 12-January-2022, Manuscript No. PULJFDR-22-4139; Editor assigned: 15-January-2022, PreQC No. PULJFDR-22-4139(PQ); Reviewed: 21-January-2022, QC No. PULJFDR-22-4139; Revised: 25-January-2022, Manuscript No. PULJFDR-22-4139(R); Published: 28-January -2022, DOI: 10.37532/puljfdr.22.6(1).1-2

protein, which serve as store polymers, are firmly compacted inside embryo cells. Every grain species (hard and soft wheat, durum wheat, and so on) and all other cereals have the same caryopsis organization. Wheat grain (together with barley and rye) is distinguished by a deep longitudinal crease (or furrow) in the ventral side that extends almost to the kernels center [9].

Rheology of bread

The existence of gluten in dough causes complicated behaviors that are crucial to the development of the end product structure when wheat flour is kneaded with water. Theologically, the most important of these are viscoelasticity, strain dependency, and history dependency features. These can be measured and understood using rheological testing, which involves applying controlled stress and strain to dough to cause distortion *via* compression, tension, or flow experiments. The rheological behavior of dough has piqued the interest of bakers and experts alike, as these features are closely linked to baking performance and bread quality. Rheology is vital to a wide range of bakery items, including cakes, which require the proper consistency of mixed batter to make a well-risen Loaf [10].

Redox agents in bakery systems

Extremely active materials, oxidizing and reducing (redox) reagents are commonly employed in the baking business to change the physical properties of dough and batter systems. Ascorbic acid, azodicarbonamide, and potassium bromate are examples of oxidizing agents, while sodium metabisulfite and l-cysteine are examples of reducing agents. A wide variety of enzymes are utilized to change dough behavior in addition to chemical-based redox components. Glucose oxidase and sulfhydral oxidase, which are frequently employed in conjunction with ascorbic acid, are instances of enzymes that require oxygen to work well. Proteases, which soften dough, and transglutaminase, which reinforces dough structures by cross-linking protein chains, are two other key enzymes. Redox agents can aid in the uniform performance of flours, ensuring that performance is consistent from one day to the next. Various dough qualities are also required for the production of various bread goods [11].

Functional bakery products

The idea of functional foods arose from advances in assessing the link between nutrition and health, often at the molecular level. Meals today are developed to not only fulfill appetite and offer essential nutrients for humans, but also to prevent nutrition-related diseases and promote consumers' physical and emotional well-being. In the 1980s, the phrase "functional food" was originally used in Japan to characterize food fortified with unique ingredients that had favorable physiological effects. Functional foods (prebiotic and probiotic foods) can help to enhance overall health, reduce the risk of some diseases, and even cure some diseases [12].

Utilization of pumpkin powder in bakery products

The study by different researchers revealed that pumpkin powder significantly enhances β-carotene content in supplemented bakery products. More than 15% of pumpkin powder substitution in sandwich bread, sweet bread and cookie formulations had too strong an effect on the physical and sensory properties of the products, while 20% pumpkin powder was optimum for butter cake, and chiffon cake. The substituted products had high energy content. A composite of pumpkin powder and wheat flour increased vitamin A by 13% per 20 g to 40 g of the baked products consumed. Chiffon cake, sandwiches bread, sweet bread, butter cake, and pumpkin cookies were accepted by the consumers [13].

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