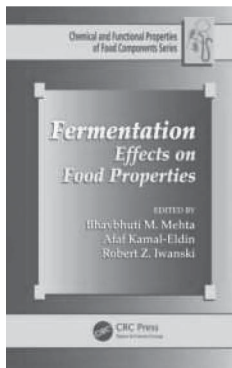


Fermentation: Effects on Food Properties: Chemical & Functional Properties of Food Components

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The book is an edited book and has described the process of fermentation thread base. It has described the process of fermentation as the oldest methods of food preservation and drying but fermentation gives food a variety of sensory characteristics flavour, tastes, textures besides nutritional and therapeutic values. The first chapter has defined the fermentation process and traced the historical developments very clearly and precisely. The art of fermentation originated in the Middle East, the Indian subcontinent, and the Far East. As early as 4000 and 3000 BC, fermented bread and beer were known in Pharaonic Egypt and Babylonia. The Rigveda (ca. 1500BC), have mentioned that the fermentation technology started to develop after observations of fermentative changes in fruits and juices. The authors have amply discussed the various historical developments in fermentations. The pioneering work of Louis Pasteur, Ellie Metchnikoff, Hans von Euler etc on fermentation technology has been highlighted appropriately.

It has been rightly emphasized in the book that their knowledge of microorganisms is essential to understand the process of fermentation, as it involves their growth and various activities that produce a wide range of desirable and undesirable substances. The microorganisms for fermentations are selected primarily on the basis of their ability to produce desirable products and to preserve or stabilize the food. The fermented products are prepared and relished world over. The microbial culture viz. bacteria (lactic acid cultures, propionic culture, acetic acid bacteria, cheese smear organisms, other bacterial culture, etc.) yeasts (wine yeasts, baker's yeasts, yeasts for malt beverages, etc.), and molds (*Penicillium*, *Aspergillus*, etc.) have been described as the complex microbial community in fermented foods in Chapter 2 of this book.

There are several fermented foods and the associated microorganisms that produce a wide diversity of taste and flavours such as cereal products sorghum beer (*angbalbili-biliburkutu*), and fermented legume products include *soybean sauce*, *tempeh*, *tofu*, *miso*, *matto*, *cheonggukjang*, *dhokla*, *dosa*, *idli*, *papad wari*, etc. The fermented vegetable products includes kimchi, sauerkraut, etc.; fermented dairy products are yoghurt, dahi (curd), shrikhand, Bulgarian butter milk, acidophilus milk, kefir, kunmis and varieties of cheese, ; fermented meat products include various types of dry sausages; and fermented fish in the form of sauces, pastes etc. The fermentation brings out various chemical/biochemical changes that primarily depend on the quality of raw materials, the various processing steps, the microorganisms used., and the type of products manufactured. The authors have documented various changes brought by the fermentation viz., compounds from various food components (carbohydrates, proteins, and lipids) during fermentation contribute to the flavor and aroma of the fermented products, depending on the chemical structure and properties of the molecules viz., lactic acid, acetic acid, propionic acid, diacetyl, carbon dioxide, ethyl alcohol, exopolysaccharides, bacteriocins, etc., which affect the flavor, texture, and consistency of the product and inhibit spoilage and pathogenic microorganisms. All these aspects have been discussed in fermented foods in Chapter 3 very precisely.

Change in texture of fermented foods is one of the fundamental process of the fermentation change in basic measurable rheological properties (hardness, consistency, adhesiveness, and viscosity), etc. The author have described the rheological

properties of such foods in chapter 4. Chapter 5 thoroughly describes the role of fermentation processes in changing the colour of foods. Fermented foods as a source of bioactive compounds has received considerable attention these days, which is a general term used to designate food constituents with extra-nutritional value, usually to reduce the effects of aging, degenerative diseases etc. The authors have discussed these compounds as related to signaling, cholesterol lowering, lipid modulation, immunity or other beneficial physiological effects in the consumers. The authors have described these aspects in Chapter 6 very emphatically. Many foods in raw state contain toxins and **antinutritional** compounds which can cause several types of undesirable changes or disorders in the body of the consumers and have to be eliminated from food before consumption and microorganisms during fermentation can remove or detoxify some of these compounds. It is one of the most desirable change brought out by the fermentation. The details of these processes are discussed in Chapter 7. The fortification of products derived from fermentation processes are discussed in chapter 8. Fermentation of various cereals is performed traditionally using mixed starter cultures, leading to variability in product quality and these issues are addressed very aptly in Chapter 9. Fermented vegetable products are high in nutritive value viz, are rich sources of vitamin C, dietary fiber, mineral salts, and antioxidants; and have a positive influence on human health. Chapter 10 looks into the details of fermenting cucumbers, cabbage (sauerkraut and kimchi), and olives, Chapter 11 thoroughly describes the fermentation of milk and milk products, as these products are highly nutritious, therapeutic, and healthy foods, as proven by Ayurveda, the old science of medicine. The various chemical changes that take place during fermentation are covered in this chapter 11. Chapter 12 discusses the fermented seafood products, especially fermented fish sauces and pastes, and various chemical changes that take place during fermentation of meat products are described in Chapter 13. The safety of food products being a most important pre-requisite has been discussed in Chapter 14 with intimate details.

The book is a very useful compilation for the students of fermentation technology, food science and technology, postharvest technology, chemical engineering, food and nutrition etc. It has focused on the various chemical changes that take place during processing, both pre- and post-fermentation that ultimately affect food properties and the quality of the finished products. It is well illustrated and has a number of references for the benefit of readers. The Chapters of the book are well planned and connected with each other. The book is in brief expected to simulate further research in this area. It is recommended to the students of UG and PG especially the researchers. The authors and the Publishers deserve complement for bringing out this book on a very important and interesting aspect.

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