

The Application of Fermentation Process in our Daily Life

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DESCRIPTION

In a world where scientific progress often seems to outpace our ability to understand, fermentation remains a captivating and enigmatic process. It's an age-old process that transforms simple ingredients into complex and delicious food. In this commentary article, we will delve into the interesting topic of fermentation to explore its background, cultural importance, and current renaissance in both the gastronomic and scientific fields.

Fermentation through the ages

The practice of fermentation dates back thousands of years. Evidence of fermented beverages, such as honey and alcohol can be traced to ancient civilizations like the Sumerians and Egyptians. These early brewers likely stumbled upon the process by accident, as wild yeast and bacteria interacted with grain and water. This unexpected findings turned to the cultivation of specific strains of yeast and the refinement of brewing techniques. Fermentation also played a vital role in food preservation. Before refrigeration, fermenting vegetables, such as cabbage into sauerkraut or cucumbers into pickles, was a way to extend the shelf life of perishable produce. Cultures worldwide developed their own fermented dishes, like kimchi in Korea and miso in Japan, creating distinct flavors and traditions.

In the case of bread, the process of fermentation was pivotal in the development of human civilization. The transition from nomadic societies to settled agricultural communities was greatly influenced by the cultivation of grains and the discovery of bread-making. The introduction of leavening agents, like sourdough starter, brought about leavened bread, which was lighter and more digestible than other breads.

The microbial illusion

The microbial illusion is at the centre of fermentation. It's an arrangement of yeast, bacteria, and other microorganisms, each of which contributes to the transformation of raw components

into something altogether new. The star of alcoholic fermentation is yeast, namely *Saccharomyces cerevisiae*, which converts carbohydrates into alcohol and carbon dioxide. Meanwhile, *Lactobacillus*, a kind of lactic acid bacteria, takes the stage in the fermentation of vegetables and dairy products, providing tangy flavours and aiding in preservation. One of the intriguing aspects of fermentation is the influence of environmental factors on the final product. The terroir, or the environmental conditions, of a region can impart unique flavors to fermented products. This is particularly evident in the world of wine and cheese, where grapes and milk from different regions yield distinct characteristics due to variations in soil, climate, and local microflora.

Cultural significance

Beyond its culinary and preservation benefits, fermentation holds deep cultural significance in many societies. In Japan, sake brewing is not just an industry; it's an art form and a spiritual practice. The process is steeped in tradition and ritual, with brewers paying homage to the microbes responsible for transforming rice into sake. Similarly, in Europe, the art of cheesemaking has been passed down through generations, with each cheesemaker adding their own touch to the craft.

Fermented foods also often feature in religious and communal celebrations. In Ethiopia, the injera, a spongy, sourdough flatbread, is a staple of the national cuisine and plays a central role in religious ceremonies. In Korea, kimchi is more than a condiment; it's a representation of culture, and preparing it along with other activities takes place at kimjang festivals.

Modern resurgence

In recent years, fermentation has experienced a resurgence in popularity, driven by both culinary innovation and scientific fields. In order to produce distinctive flavours and senses, professionals and food aficionados are experimenting with fermentation.

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The "fermentation renaissance" has led to the emergence of trendy restaurants and food products that feature fermented ingredients like kombucha, kefir, and kimchi.

This revival extends to the craft brewing industry, where small-scale breweries are experimenting with wild and native yeasts, resulting in beers that capture the essence of their regions. The craft beer movement has turned beer into an art form, with brewers pushing the boundaries of flavor and technique, often inspired from ancient brewing traditions. In the scientific field, researchers are exploring the potential uses of fermentation. From biofuel production to pharmaceuticals and biotechnology, the microbial processes that drive fermentation have far-reaching implications. Scientists are utilizing the energy of microorganisms to produce valuable compounds, such as insulin and antibiotics, in more sustainable and efficient ways.

Health benefits

Fermentation isn't just about flavor and preservation; it also offers health benefits. Fermented foods are rich in probiotics-live

beneficial bacteria that support gut health. Consuming probiotics has been linked to improved digestion, strengthened immune function, and even potential mental health benefits.

CONCLUSION

Fermentation, an ancient and religious process, stands as a testament to the enduring relationship between humans and the microbial world. From the dawn of civilization to the forefront of modern science, the microbial transformation of food and drink remains a source admiration.

As we embrace the revival of fermentation in our kitchens, breweries, and laboratories, we celebrate the enduring legacy of this age-old alchemy that connects us to our past and propels us into the future.