



Historical journey of alcohol production

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Abstract: Alcohol has played a variety of functions in human civilization for thousands of years, from ceremonial, medical, and recreational consumption. Alcohol has been produced since the dawn of civilization; evidence of fermented drinks may be

found in China as early as 7000 BCE. Fermentation methods and the understanding of different raw resources, such as grains, fruits, and honey, developed along with civilizations. The equation for general chemistry is $C_6H_{12}O_6 \rightarrow 2 C_2H_5OH + 2 CO_2$. This process is used to create spirits, which typically have an alcohol by volume (ABV) of 30–50% or more, in contrast to wine (8–14% ABV) and beer (4–6% ABV). The evolution of alcohol from simple fermented drinks to stronger distilled spirits demonstrates how strongly alcohol production is linked to human growth. People who consume large amounts of it daily will develop a habit of drinking, which is bad for their health.

Keywords: Alcohol, Civilization, Consumption, History

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Introduction



Alcohol has been an integral part of human culture for thousands of years, serving diverse roles ranging from ceremonial and medicinal use to recreational consumption. It is broadly defined as a chemical compound containing one or more hydroxyl (-OH) groups attached to a carbon atom. In everyday language, "alcohol" typically refers to ethanol, the psychoactive ingredient found in alcoholic beverages such as beer, wine, and spirits (1). The production of alcohol dates back to ancient civilizations, with evidence of fermented beverages appearing as early as 7000 BCE in China and later in Mesopotamia and Egypt. Traditionally, alcohol was produced through fermentation, a natural biochemical process by which yeasts convert sugars into ethanol and carbon dioxide in anaerobic conditions(2).

Alcohol has been used for cultural, religious, medicinal, and recreational purposes, making it one of the most widely consumed and socially embedded substances in the world. A consumable type of alcohol produced through the fermentation of sugars by yeasts(3). Additionally, beer has long been an integral part of human life: it was and remains a valuable food staple that has undergone constant improvement and adaptation to meet human needs. For most of the time, intoxication was not the main purpose and could only be achieved to a limited extent, if at all, given that beer had a low alcohol content for most of human history(4).

History

The production and consumption of alcoholic beverages can be traced back to Neolithic times, around 7000–6600 BCE, with archaeological evidence found in ancient China indicating early forms of rice mead. By 3000 BCE, beer and wine were commonly consumed in Mesopotamia and Ancient Egypt, often associated with religious ceremonies and community feasts(2). As civilizations evolved, so did fermentation techniques and the knowledge of various raw materials, including grains, fruits, and honey. The invention of distillation, likely by Arab scholars in the 8th or 9th century CE, marked a significant turning point. This technique enabled the extraction of higher concentrations of ethanol, resulting in spirits or distilled alcoholic beverages such as brandy, whiskey, vodka, and rum. These innovations spread to Europe and Asia, leading to the commercial and industrial-scale production of alcohol(5).

In the 19th century, not only was the scientific basis for wine production established, but also vast improvements in the storage and transportation of wine occurred. Between 1840 and 1914, a worldwide wine industry emerged (6). The first man-made beverages were alcohol-containing beer and wine. We now know that the production of beer and wine involves the generation of ethanol by the fermentation of natural sugars derived from grains in the case of beer and grapes in the case of wine. Viticulture, the cultivation and harvesting of grapes, also known as wine growing, dates back to ancient times. Based on archaeological evidence, the production of beer and wine was a crucial and even essential factor in the development of agriculture and the transition of humans from roaming bands of hunter-gatherers to settled groups of farmers. Throughout history, production and consumption of wine, beer, and other alcoholic



beverages have been widespread, and it is recognized as one of the most universal of human behaviors(7).

Scientific Basis and Production: Alcohol is produced via fermentation, a metabolic process in which microorganisms, primarily *Saccharomyces cerevisiae* (brewer's yeast), convert fermentable sugars (such as glucose or fructose) into ethanol and carbon dioxide under anaerobic conditions. The general chemical equation is: $C_6H_{12}O_6 \rightarrow 2 C_2H_5OH + 2 CO_2$

This process is used in the production of traditional beverages like beer, wine, and cider, where the source of sugar varies: malted barley for beer, grapes for wine, and apples for cider.

In the case of distilled beverages, the fermented product undergoes distillation, a process of heating and condensation, to concentrate the alcohol content. This method is used to produce spirits, which often contain 30–50% alcohol by volume (ABV) or higher, compared to beer (4–6% ABV) and wine (8–14% ABV)(8).

Conclusion

Alcohol has long been a part of human civilization, valued for its ceremonial, medicinal, and social uses. While chemically it refers to ethanol, the main ingredient in alcoholic beverages, its meaning and significance go far beyond its structure. From ancient times, alcohol has been consumed in various forms, such as beer and wine, which are made through the natural fermentation of sugars. Over time, it became not just a drink but a cultural symbol present in rituals, gatherings, and everyday life across different regions of the world.

The history of alcohol production shows how closely it is tied to human progress. Beginning as early as 7000 BCE in China, alcohol evolved from simple fermented drinks to stronger distilled spirits developed by Arab scholars. As agriculture advanced, so did the ingredients and techniques used in brewing and winemaking. Later, with scientific discoveries and industrialization, alcohol became a global product. This long journey highlights alcohol's deep roots in our past and its lasting presence in modern society. If consumed in higher volume regularly, it will make one addicted, known as an alcoholic.

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