Yeast in alcoholic fermentation

**Introduction**

Fermentation is a well-known natural process used by humanity for thousands of years with the fundamental purpose of making alcoholic beverages, as well as bread and by-products.

fermentation is a process of central metabolism in which an organism converts a carbohydrate, such as starch or sugar, into an alcohol or an acid.

Yeast plays a vital role in the production of all alcoholic beverages. Yeast plays a vital role in the production of all alcoholic beverages and the selection of suitable yeast strains is essential not only to maximise alcohol yield, but also to maintain beverage sensory quality.

#### Wine Fermentation

In wine fermentation, strains with specific characteristics are needed, for instance, highly producers of ethanol to reach values of 11–13% v/v, typically found in this beverage.

#### Beer Fermentation

Beer is the most consumed alcoholic beverage worldwide. It is traditionally made from four key ingredients: malted cereals (barley or other), water, hops, and yeast. Each of these ingredients contributes to the final taste and aroma of beer. During fermentation, yeast cells convert cereal-derived sugars into ethanol and CO2.

 two types of yeast are used in brewing: S. cerevisiae as the top-fermenting yeast to make ales while S. pastorianus is a bottom-fermenting yeast used in lager brewing processes.

#### Cider Fermentation

Cider is another alcoholic beverage derived from the apple fruit industry. Although traditional ciders are produced from spontaneous fermentation of juice carried out by autochthonous yeasts, selected S. cerevisiae strains are also commonly used to carry out alcoholic fermentation.

 Yeast as EPS

Extracellular [polysaccharides](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/polysaccharides) (EPS) are produced by yeast species from the Candida, [*Cryptococcus*](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/filobasidiella), *[Lipomyces](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/lipomyces%22%20%5Co%20%22Learn%20more%20about%20Lipomyces%20from%20ScienceDirect%27s%20AI-generated%20Topic%20Pages)*, *[Pichia](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/pichia%22%20%5Co%20%22Learn%20more%20about%20Pichia%20from%20ScienceDirect%27s%20AI-generated%20Topic%20Pages)*, *[Rhodotorula](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/rhodotorula%22%20%5Co%20%22Learn%20more%20about%20Rhodotorula%20from%20ScienceDirect%27s%20AI-generated%20Topic%20Pages)*, and *[Sporobolomyces](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/sporobolomyces%22%20%5Co%20%22Learn%20more%20about%20Sporobolomyces%20from%20ScienceDirect%27s%20AI-generated%20Topic%20Pages)* genera Some of these polysaccharides exhibit specific physico-chemical and rheological properties, which are useful in the production of food and in the cosmetic and pharmaceutical industries as well . EPS containing more than 50% [mannose](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/mannose) in their composition are characterized by biological activity, e.g. linear mannans from *[Rhodotorula mucilaginosa](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/rhodotorula-mucilaginosa%22%20%5Co%20%22Learn%20more%20about%20Rhodotorula%20mucilaginosa%20from%20ScienceDirect%27s%20AI-generated%20Topic%20Pages)*, which exhibit [anti-tumor activity](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/antineoplastic-activity) in experimental animals , or [glucomannan](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/glucomannan%22%20%5Co%20%22Learn%20more%20about%20Glucomannan%20from%20ScienceDirect%27s%20AI-generated%20Topic%20Pages) from [*Candida utilis*](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/cyberlindnera-jadinii), which possesses [antioxidant activity](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/antioxidant-activity) .

The production of exopolysaccharides is associated with the secondary metabolism of yeast, and their structure as well as physico-chemical properties depend on many factors. Culture medium composition, in particular the source of carbon and nitrogen, and culture conditions, the degree of [oxygenation](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/oxygenation) and temperature have the greatest impact on the amount and characteristics of polymers produced during fermentation. Most strains produced EPS in media containing such carbon sources as [pentoses](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/pentoses%22%20%5Co%20%22Learn%20more%20about%20Pentoses%20from%20ScienceDirect%27s%20AI-generated%20Topic%20Pages), [hexoses](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/hexoses%22%20%5Co%20%22Learn%20more%20about%20Hexoses%20from%20ScienceDirect%27s%20AI-generated%20Topic%20Pages), [disaccharides](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/disaccharides) and [triose](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/triose%22%20%5Co%20%22Learn%20more%20about%20Triose%20from%20ScienceDirect%27s%20AI-generated%20Topic%20Pages). For instance, strains from Sporobolomyces and Cryptococcus genera produced various amounts of EPS in mineral media containing, among others, glucose, sucrose, [xylose](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/xylose%22%20%5Co%20%22Learn%20more%20about%20Xylose%20from%20ScienceDirect%27s%20AI-generated%20Topic%20Pages), [ribose](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/ribose), [arabinose](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/arabinose%22%20%5Co%20%22Learn%20more%20about%20Arabinose%20from%20ScienceDirect%27s%20AI-generated%20Topic%20Pages), [galactose](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/galactose%22%20%5Co%20%22Learn%20more%20about%20Galactose%20from%20ScienceDirect%27s%20AI-generated%20Topic%20Pages), mannose, [rhamnose](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/rhamnose%22%20%5Co%20%22Learn%20more%20about%20Rhamnose%20from%20ScienceDirect%27s%20AI-generated%20Topic%20Pages), [raffinose](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/raffinose%22%20%5Co%20%22Learn%20more%20about%20Raffinose%20from%20ScienceDirect%27s%20AI-generated%20Topic%20Pages), and [trehalose](https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/trehalose).