

FERMENTATION - Spiritsfully

 spiritsfully.com/fermentation.html

WHAT IS FERMENTATION AND HOW DOES IT WORK?

Fermentation is the action of yeast on the sugars. The yeast "eats" the sugar, and in doing so, transforms the sugar (metabolizes would be a better word) into ethyl alcohol, carbon dioxide and energy.

Fermentation is an important step into spirits making, especially for darker spirits as this is during fermentation that flavors compounds a.k.a. congeners are made. These flavors will be concentrated by the distillation afterwards. **Not only the type of yeasts plays an important role but the final spirit is also affected by the length of the fermentation.** A long fermentation creates a wider range of different aromas, as it produces more congeners, a short fermentation gives less congeners and a lighter spirit. Yeasts are actively added by the human hand or favored, the human hand creating the conditions for them to grow. The yeasts actually "consume" or feed themselves on the sugar and, while doing so, produce carbon dioxide, different types of alcohol and heat. The produced alcohol are ethanol, propanol, butanol, methanol, amyl alcohol, as well as aldehydes, esters and acids and it is up to the distiller which ones to retain or to discard (some are actually harmful, and other only convey an unpleasant taste), same for the lees which is the name given to the dead cells. They are often discarded but one can decide to keep them to give additional flavour to a spirit.

Distillation will help to pick and choose which alcohol or ester to keep.

Fermentation will end naturally if the yeast runs out of sugar or produces too much ethanol so that the mixture toxic to itself. It is sometimes desirable to cut the process sooner if you want to keep sugar or want yeast flavours in the final product. How? in playing on the temperature (freezing/warming up...)



CURIOUS ABOUT YEAST?

Yeast is added to the just "converted" liquid during fermentation. **Yeast are single-celled fungi that contain special enzymes.** Good producers are careful when selecting their yeasts, as the choice of yeast influences the resulting spirit.

The choices are:

- **commercial yeasts**, which give spirit with less complexity but allow good control over fermentation. Yeast products are available in many different forms such as cream yeast,

block yeast, dried yeast or dried instant yeast. Lactobacillus Brevis will give more mushroom impression, or Oenococcus Oeni will tend toward pineapple hints*. The spirit industry is a major consumer of yeast but not any yeast can be used as for distilled spirits you need yeast that can resist high alcohol (yeasts allowing wine fermentation die by 17% abv. for ex).

- **house yeasts** or yeasts isolated by the distiller, which allows a good control over fermentation and good complexity.
 - **wild yeasts**, which less control over when and if fermentation will occur but convey high complexity to the final spirit.
- To increase complexity or limit risks, multiple strains can be used.

Check this post [here](#) in which you can see how yeast can affect the final spirits, with the example of mezcal.

This fermentation wheel is coming from the book **Distilled Knowledge** by Brian Hoefling. It shows the impact on flavours of type of yeast.

The book is a fascinating read and this wheel clearly pictures a scientific fact: the "impression" of banana or of chocolate in an alcohol is not a question of imagination from spirits critics, this is the ability to discernate taste at a molecular level through years of training !

