



## The optimum temperature for yeast growth.

The optimum temperature for yeast growth is 32 degrees C. Yeast cell death occurs above 38 degrees C. So why don't we ferment our beers, wines, meads, and ciders at 32 degrees C, decreasing the time that it takes to produce the beverage? Why do we make yeast work slower? Because what's best for the yeast is not best for the beer, wine, mead or cider. As they grow and multiply, yeast produces many compounds, the most noticeable of which are esters. As the temperature of the fermentation rises, more yeast growth occurs, and consequently more esters are produced. At 32 degrees C yeast produces so much acetaldehyde (which smells and tastes like green apples) that the product becomes undrinkable.

The optimum ale fermentation temperature has been found to be 20 degrees C. This strikes the best balance between yeast growth and ester formation for most strains. For hefeweizen-style beers, some brewers like to ferment above 27 degrees C, which increases the level of banana-flavored esters produced by these strains. Most ale strains are unable to grow below 13 degrees C, which is the most common lager fermentation temperature. This fermentation temperature greatly reduces the ester-forming ability of most lager yeast strains, creating the clean flavor associated with lager beers. Ester levels are kept low, placing the emphasis on malt and hop flavors.

White wine, mead and cider yeast ferment best between 13 and 24 degrees C while red wines should be fermented between 18 and 24 degrees C. As with lager yeast, this temperature range reduces the undesirable ester formation and allows the character of the grape to dominate. A crisper wine will be produced by fermenting at cooler temperatures. Although most wine yeast tolerate temperatures up to 32 degrees C., ester formation is high during warm fermentation. Cleaner wines are produced by fermenting in the low 20's. When fermenting at the upper end of the temperature tolerance of a yeast strain, they tend to burn out near the end of fermentation when the alcohol level is high leaving sugary sweetness in the wine.

