



Stuck Fermentations

A *stuck fermentation* occurs when the process of fermentation ceases and not all of the available sugars have been converted to alcohol.

Why does this happen? What do you need to do to restart the fermentation and finish the fermentation process?

In my winemaking experience I have on a couple of occasions had a stuck fermentation and on a couple of other occasions I just thought that I had a stuck fermentation! My experiences with thinking that I had a stuck fermentation were two: on the first occasion I did not have a good seal between the airlock and the grommet in the top of my fermenting bucket and on the second occasion I did not get the lid snapped down tightly. Both of these occasions allowed the CO₂ gasses to escape without passing through the airlock and caused me to believe that nothing was happening. I also had a customer recently who did not put liquid in his airlock and was quite frantic believing that fermentation had not started when in fact it was almost done!

So first we need to make sure that you do indeed have a stuck fermentation. The proof of this lies in the use of your hydrometer (a separate article is posted on our *How To* links on the use of your hydrometer).

Take hydrometer readings on consecutive days to determine if the hydrometer reading is falling as it should. The possibilities are that your wine (or beer) is in fact still fermenting although slowly, that your fermentation is complete or that you do in fact have a stuck fermentation.

I generally have a personal credo that I *never blame the yeast* but I am sure that I will be proven wrong on that someday!

In fact, the problem probably does center around the yeast but more than likely it is a problem not with the yeast but with the environment.

Situations which can lead to an unfinished fermentation include the presence of bacteria, temperature and yeast nutrition. Remember that yeast needs lots of food, a sanitary environment and a temperature within its recommended range.

A short list on causes of stuck fermentation would include but not be limited to:

Improper rehydration of yeast (rehydrated at too warm or too cool of a temperature);

Shock when the rehydrated yeast is pitched into the must (the temperature of the rehydrated yeast should be fairly close to the temperature of the must or wort).

Excessive amounts of CO₂ present in your liquid (did you degas your must or wort)?

The presence of sorbates in your ingredients (some fruits have natural sorbates and if purchasing commercial juices sorbate is sometimes added as a preservative). This will hinder a good fermentation.

Using yeast that is past its *best by* date which is usually stamped along the edge of the packet. Yeast has an extended shelf life and you can help keep your yeast healthy by refrigerating it until you are ready to use it.

Unsanitary conditions. Preparing your equipment for fermentation is a two-step process. Cleansing (washing thoroughly with soap and water and then rinsing) and then sanitizing your equipment with a product such as Easy Clean.

Fermenting in an environment that is too hot!

Fermenting in an environment that is too cold!

The presence of too much sulphite in your wine must. This can be the addition of too much sulphite (this is a yeast killer when added in too much quantity) or when starting the fermentation process, adding sulphites (Campden tablets) to your must to kill wild yeasts and bacteria and then not waiting the recommended 24 hours prior to pitching yeast.

Dirty fruit. Remember that unwashed fruit can bring bacteria and other contaminants into your must.

Lack of food for your yeast. This can be in the form of a shortage of nitrogen or in a lack of some amino acids.

A high starting specific gravity. At some point the yeast used will reach its saturation

point and it will not be able to convert any more sugar to alcohol because the alcohol level is high enough to effectively kill the yeast. You are now left with a wine that is fairly high in alcohol and also sweet. Different yeasts have different tolerances for alcohol presence and using the correct yeast for your application is important.

Before we move on, I want to digress to a prior point listed about the rehydration of yeast.

Personally, I never rehydrate the yeast that I use. The benefit of rehydration is that if done properly you have a somewhat healthier yeast which is ready to begin fermentation immediately upon entering the must or wort. This allows for more healthy yeast cells and a faster start to the fermentation process.

On the down side, there are several inherent risks in rehydration (killing the yeast by rehydrating at too high or too low a temperature or yeast shock when the yeast is pitched). When I start a batch of wine, I use two packets of yeast (when one would do!) and simply sprinkle the yeast on top of the must or wort and let the liquid naturally rehydrate the yeast. Thirty years of making wine (and some beer) and never a problem with getting an active fermentation started.

So, the list above tells you the causes of stuck fermentation and should also give you clues on how to prevent a stuck fermentation!

But . . . the best laid plans can still go astray!

The first question I ask when dealing with my own or a customer's stuck fermentation is what is the ambient temperature where the fermentation is being attempted? The range of most yeast is between 65°F and 75°F. Most often my clients have had a

Temperature on the lower side of this range and so the first thing I tell them to try is to raise the temperature into the 70 to 75°F temperature range.

The second thing to try is to stir the must or wort to bring the sediment up from the bottom. Sometimes this stirring action will get the yeast activated again.

Third in my list of things to try is the addition of yeast energizer. Do not add additional yeast nutrient! Add a half teaspoon of yeast energizer per gallon of liquid.

In conjunction with the third step, I also recommend a vigorous oxygenation of the liquid. Everyone says that oxygen is the enemy of wine but it is a friend of yeast. In particular, if you are at the very beginning of the fermentation process, a good stirring with a slotted spoon or a wine whip will possibly invigorate your yeast.

If all of this does not get things rolling, then you can introduce additional yeast to the liquid. First, however, rack the wine to a clean container leaving the old yeast behind, then add new yeast. Recommended yeast strains to use are Red Star Premier Cuvee or Lalvin EC-1118.

Finally, if your wine does not start fermentation within a couple of days, try making a yeast starter (see separate link) and attempt to start (or restart) the fermentation.