A Note from the Cornell Enology Group
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Stuck Fermentation - a Sticky Situation

Sluggish fermentations are mainly observed or detected when 80 % of the total sugar content is converted in an alcoholic fermentation. It happens often in wines with a high initial sugar content (23 Brix and more).

Reasons
There are several reasons why a fermentation might stick:

- Cold temperature or temperature shock
- Lack of nutrient in the must
- Imbalance or lack of glucose
- Yeast strain

Cold Temperature: If you prefer fermenting your wines at low temperature (below 18°C or 64°F) you can do so if you choose an appropriate yeast. If you choose a cool fermentation temperature it is best to start out at a moderate temperature near 20°C and then slowly lower the temperature to avoid temperature shock (no faster than 5°C per hour). At the end of the fermentation stop cooling or even start warming to ensure that the fermentation goes to dryness. Avoid temperature shock: rapid cooling or rapid heating will shock the yeast and cause stuck fermentations. Do not heat or cool a fermentation more than 5°C per hour. When adding a starter culture, make sure that the difference of the starter culture temperature and the must temperature is less than 10°C. The upper temperature limit for yeast growth is between 35 and 40°C, depending on the concentration of ethanol.

Lack of nutrients in the must: Low amounts of yeast assimilable nitrogen in grape musts can cause with stuck and sluggish fermentation as well as with the production of unwanted sulfide compounds. New York grape musts consistently have very low yeast available nitrogen content. This is the reason why it is recommended to add yeast nutrients to the grape musts.

Imbalance or lack of glucose: The two main sugars in grape juice are glucose and fructose. Unfortunately the Saccharomyces yeasts are alcoholic glucophilic i.e. they prefer to utilize glucose over fructose. As soon as the glucose to fructose ratio is below 0.2 (five times more fructose than glucose) the possibility of a sluggish or stuck fermentation is given. Apparently, Saccharomyces cerevisiae need some amount of glucose in order to transport the fructose into the cell.

Yeast strains: Some strains don't tolerate high concentrations of alcohol.

What can be done?

1. Bring or send us a sample and we will analyze glucose and fructose.
2. If the glucose to fructose ratio is below 0.2 such wines can be restarted with the addition of glucose (5 to 20 g/L is usually enough). Rack the wine from the old yeast and reinoculate with a fresh yeast starter which you adapted to the alcohol content.
3. Move the juice or wine to a warm location. Generally 22° C (72° F) is warm enough to get it going. Stir the young wine once in a while, aeration will help.