

## MAKING HIGH ALCOHOL WINES

### PORT AND SHERRY

Wineries generally make these *fortified* wines by adding high proof brandy during fermentation to achieve about 20% alcohol. This addition stops fermentation at a point that leaves the wine at the sweetness the winemaker wants to have. Although we could apply this same technique to wines at home, we will find it far more economical (due to taxation) to make these wines by fermenting sugar to the maximum alcohol tolerance of our yeast. Given a good recipe and proper conditions, we can ferment to 19% alcohol or more. Then, a much smaller addition of brandy is needed.

Since the yeast cannot tolerate all at once the total sugar necessary to achieve maximum alcohol content, we recommend a starting SG no higher than 1.100 (1.095 warm). After fermentation is established in normal fashion, then a process of feeding measured amounts of sugar along with yeast energizer, usually in three increments, achieves the total sugar needed without harm to the yeast. Heavy sherry and tawny port will need to be oxidized after high alcohol is attained. Air contact and a somewhat lower acid level, around 0.5% if possible, will facilitate the oxidation. Spoilage bacteria cannot harm the wine during this stage because of the high alcohol content. For these wines, use a 4 gal. recipe and do the oxidizing step in a 5 gal. carboy. Ruby port or dessert fruit wines which will not be oxidized, should be made to yield 5 gal. with acidity around 0.7 to 0.8%.

### FRUIT WINES

To achieve the most pleasing results, we will need to limit the alcohol to levels which are in balance with the flavor intensity of the wine. Unless the wine has very intense flavor it is probably better not to make maximum alcohol in it. We have the option of using the feeding technique, but stopping after only one or two sugar additions. Even without feeding additional sugar, a starting SG of 1.100 translates to 14% or more alcohol, depending on how far the fermentation proceeds before stopping. Each 0.010 increase in SG contributes about 1.5% additional alcohol to the wine. After feeding additions are completed, continue with normal processing through bulk aging and preparation for bottling.

### FEEDING TECHNIQUE

When the SG in the primary fermenter has fallen to about 1.070 to 1.080, add 1 lb. cane sugar (about 2 measuring cups) to a 4 gal. batch (or 1-1/4 lb. to 5 gal.) and 1/2 teaspoon yeast energizer. The sugar may be dissolved in a little water before adding if desired. The SG increase from this addition should be about 0.010 in either case. Temperature at about 65 to 70 °F will maintain a steady but controlled fermentation. The next day, repeat the same sugar and yeast energizer additions to generate another 0.010 SG increase.

To maximize alcohol, repeat the additions a third time and rack the wine to a 5 gal. carboy and

attach a fermentation lock with sulfite solution inside. At this point, the SG will have been increased by about 0.030 and the sugar total is equivalent to having started at an SG of 1.130. Place the carboy in a location where 72 to 74 °F can be maintained until fermentation stops. Cooler temperatures reduce yeast activity so that all sugar may not be used, and warmer temperatures increase the toxicity of the alcohol and kill the yeast before maximum alcohol has been achieved.

A final SG of 0.995 indicates more than 18.5% alcohol has been made. If higher alcohol is desired, we can add 750 ml. of a good 80 proof brandy. Added to 4 gal., this raises alcohol to about 19.5% and added to 5 gal., to about 19.3%.

### PORT AND SHERRY

Once alcohol content of 18% or more is achieved, bacteria cannot live in the wine and the air contact and temperatures necessary to oxidize these wines will not cause spoilage. Rack the wine from its sediments to another carboy and stopper the top with a clean cotton plug or a fermentation lock without liquid inside. Place the carboy in a location where there is daily temperature variation. The warmer the high end of that range (up to about 90 °F), the faster the oxidation will take place. Taste the wine periodically to follow the development of the port or sherry flavor. Several months will normally be needed.

Sugar syrup or winegrape concentrate and 4 oz. of glycerine may be added to sweeten the wine at any time during the oxidation stage, but must be carried out at some time before bottling in any case. Sherry will be improved and cleared by fining with sparkolloid a few weeks before bottling. Port may profit from a few months on oak chips prior to bottling. This can be done before or after the wine is sweetened.

Because port and sherry are oxidized and contain high alcohol, these wines will improve during bottle aging for a long time. They will last almost indefinitely should one wish to set a bottle or two aside for special occasion 10 or 20 years in the future.



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