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Wine: Natural Product Obtained Using Grapes

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COMMENTARY

Wine is made using fermentation of grapes. Grapes which contain all the required esters, tannins and acids are selected for wine making. Sweetness and acidity should be in balance when the grapes are picked. Some other methods of producing wine includes: addition of sulfur dioxide, using small fermenting vessels during processing, use of cool temperatures with the objective to stop the fermentation before all the sugar is fermented [1-3]. Wine is produced in following steps:

Harvesting

Mature Grapes are picked and rotten grapes are removed. Clusters of grapes are cut from the vine and is then put into buckets or boxes and then transferred to larger containers for transport to the winery. Harvesting can be done mechanically or by manually using hand. Mechanical harvesting includes shaking berries from the clusters or on breaking the stems. Mostly, harvesting is done by hand as machines ruins the grapes and vineyard. Wine makers sorts the grape bunches, culls out rotten or under-ripe fruit before crushing of grapes are done.

Crushing

Grapes are crushed and stemmed using crusher-stemmer which contains perforated cylinder with paddles revolving at 600-1,200 revolutions per minute. Berries of the grapes are crushed and put into cylinder perforations passing out stems at the end of the cylinder. Earlier crushing was done using feet. Champagne is made using red grapes by pressing the grapes. Red grapes are put into tanks and then tank is closed. This result in those grapes consumes oxygen and produces carbon dioxide which kills the skin cells and loses semi permeability and allows easy color extraction. There is intracellular respiration of malic acid. This is slow respiration process and results in wines of low color and acidity. Mechanical presses tread heavily the grapes into must. Must is fresh grape juice and is byproducts of crushing process. In white wine they must is pressed after crushing to separate the juice from the skins, seeds, and solids and thus unwanted color and tannins is not present in white wine.

Juice separation

After crushing, juice is separated from the skins and seeds. There are two processes to separate the juice from the solids. Draining off by placing the crushed grapes in a container that have false bottom and often false sides. This is called the free run juice and the mass of crushed grapes is called the must, unfermented grape juice. Crushed grapes are put in press which has pressure from both sides. Crushed grapes are then put into cylinder whose tube is inflated which presses grapes against rotating sides and ultimately juice is produced from perforations. Drained pomace from fermentations can be used to provide distilling material for production of wine spirits.

Fermentation

Fermentation is usually a biological process which allows breakage of glucose into carbon dioxide, alcohol and water in presence of microorganism. Juice ferments naturally within 6 hours-12 hours in presence of wild yeasts in the air. This process is started by inoculating some must in the juice. Fermentation continues till sugar is converted to alcohol and a dry wine is produced. Fermentation time is from ten days to a month. In order to make sweet wine, process is halted in between to prevent entire sugar from converting into alcohol. Requirements for a fermentation process includes suppression of the growth of undesirable microorganisms, presence of desirable yeasts (*Saccharomyces* Species), proper nutrition for yeast growth, temperature control for prevention of excessive heat and prevention of oxidation.

Clarification

Tannins, proteins and dead yeast are removed from the wine in this process. And after clarification these wines are stored in

oak barrels for ages. Larger the wine is stored, good is the quality of the wine. Pomace is left at bottom of fermenting tank once the wine is clarified. Filtering and fining of the wine are also done in this stage. Filtration is done using course filter which catches large solids to a sterile filter pad that strips wine of all life. Fining is done by adding substances are added to a wine to clarify them. Clay is added to wine to precipitate dead yeast cells for settling of unwanted particles at the bottom.

Aging and bottling

Aging can be done by transferring the wine to oak barrels, stainless steel tanks or bottles. Oak barrels providing aroma and vanilla like flavor to the wine. Barrels increases oxygen exposure of the wines and thus allow tannins reduction which leads to ultimate flavor of the wine [4-5].

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