

# Alcohol composition analysis



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## ALCOHOL

### C hemical Composition (ingredients) of 4 types of alcoholic beverages:

The ingredients differ according to each beverage but there are a couple that are available in all of them, these are water and ethanol. These two ingredients are essential in every alcoholic beverage.

Champagne can only be made from white Chardonnay grapes and red Pinot Noir and Pinot Meunier grapes. It's usually a blend of two or three of the grapes, but is sometimes just made from one (though rarely is Champagne made from just Pinot Meunier). Champagne made entirely from Chardonnay is called "blanc de blancs" (meaning white wine from white grapes), and Champagne made entirely from Pinot Noir is called "blanc de noirs" (meaning white wine from black grapes). Even though black grapes are used, the wine itself is never red. The skins (where the pigment resides) are removed immediately after the grapes are pressed, which keeps the juice clear. The only exception is with rosé Champagne. Rosé can be produced by leaving the skins in the juice just long enough to tint it, or by producers adding red Pinot Noir wine directly to the blend. This second method allows them to create the same color each year. Carbon dioxide is added in the process which creates the fizzy bubbles.

Vodka is usually made from rye or potatoes if it is from Eastern Europe and molasses from other parts of the world. It contains flavors derived from wheat, grain or starch. Apart from the main raw material, the other major constituent of your bottle of Vodka is water. Over 60% of your bottle is

composed of water, so its purity is of utmost importance to the taste of your vodka. Quite an elaborate purification process is undertaken.

Tequila is made with the fermented sap of the blue agave plant; tequila is produced in and around the town of Tequila in Mexico's Jalisco province. Many superior brands of tequila are made entirely from Blue Agave, and will say so on the label. Tequila can also be made with a mixture of agave and other ingredients, like sugarcane—these products are called mixto tequilas.

Malt whisky must contain no grain other than malted barley and is traditionally distilled in pot stills. Grain whisky may contain unmalted barley or other malted or unmalted grains such as wheat and maize (corn) and is typically distilled in a continuous column still. Color and flavoring chemicals are added to create that unique color and taste

#### Methods and Procedures used in the production of alcoholic beverages:

If the sparkling wine is produced outside of Champagne, France, but is made by the “ French Method,” it is usually labeled “ Méthode Champenoise.” This is true of most American sparkling wines. Méthode Champenoise, which is the method used in Champagne, involves several distinct steps. The key reaction of winemaking is alcoholic fermentation, the conversion of sugar into alcohol and carbon dioxide by yeast. The maximum amount of alcohol attained through alcoholic fermentation is about 15% because the yeast cells are killed by high alcohol concentration. The maximum alcohol content can be determined by multiplying 0. 55 times the percent sugar initially present in the grape juice before fermentation. For example, if 24% sugar is initially present, about 13% (0. 55 x 24) alcohol will be realized. Most still wines (i. e.,

table wines) contain 12 to 14% alcohol. The key process in producing Champagne is a SECOND fermentation that occurs in a sealed bottle.

Theoretically, vodka can be made from almost any fermentable organic material - from whey to molasses. Absolut Vodka, however, is made solely from grain, which more than 400 years of tradition has proven to produce the best and purest vodka possible. Absolut Vodka uses a special method of distillation that retains a smooth grain character and is extremely low in unwanted by-products. A few thousand years ago, someone made the bright discovery that when deprived of oxygen, the yeast cell turns sugar into carbon dioxide and ethanol. Fermented beverages are born. These beverages were eventually distilled, giving us dozens of different spirits, one of which is vodka.

Fermentation is an extremely delicate and complicated process where the yeast cell converts the sugar in the mash to ethanol. The result is a mixture with an 8% alcohol content and a hundred or so by-products, some unpleasant tasting, some harmful. A concern for quality from the very beginning of the production process minimizes these impurities - using only high quality grain, preparing the grain, safeguarding against bacteria and carefully controlling the fermentation process. Virtually all remaining impurities are removed in the distillation and rectification. Turning the fermented grain mash to vodka takes distillation. The principle has remained unchanged ever since it was discovered over a thousand years ago. There are two kinds of distillation: batch distillation and continuous distillation. Batch distillation is an age-old method used for many types of spirits. Refined to a high degree of sophistication, this method is still used in areas

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like Cognac and the Scottish highlands to make cognac and whisky. Absolut Vodka, however, is distilled using the second method, continuous distillation. This type of distillation builds on the same laws of physics as batch distillation. The essential difference is that the spirit is cycled back and forth producing a very pure final product. Continuous distillation turns the 8% fermented mash into crude spirit with an alcohol concentration by volume of 85-90% (170-180 proof). The last step is rectification, a method of removing unwanted by-products introduced over a century ago by the man on the bottle's medallion – Lars Olsson Smith. The crude spirit passes through a number of columns, each designed to remove a different set of impurities. One column extracts unpleasant tasting solvent compounds; another removes fusel oil; a third methanol; a fourth concentrates the spirit – 96% pure alcohol by volume and extremely low in impurities. It is here we are faced with the dilemma of vodka production – distillation and rectification technology have advanced so far towards producing absolutely pure vodka that it has also succeeded in removing trace elements that give vodka the character of the raw material from which it is made. Absolut Vodka has solved this dilemma by, parallel to the main distillation, producing a spirit where the goal is to retain the fine character of the grain. The final composite spirit, produced at or above 95% alcohol by volume (190 proof), has that unique smooth and fine character. Exactly how this is done is a well-kept secret.

The process of making tequila begins with the jima, the harvest, and the jimadores, those responsible for growing and eventually harvesting the agave plant. The plant will be weighed, cut up in halves or quarters, and

cooked. The modern method involves using steel pressure cookers called autoclaves. The latter approach cooks the plant faster. Fortunately, flavor doesn't vary with either process. Agave is cooked to transform starches into sugars, which will then become transformed into alcohol. To extract the *agua miel*, or honey water, the cooked fruit passes through grinding blades. Fibers are sprayed with water, ensuring all sugars are released. Leftover fibers, known as *bagazo*, are generally used as fertilizer for agave fields. The juices are now ready to be fermented. This is each tequila starts to acquire its unique taste and classification. If the producer wants 100% agave tequila, then the juice passes straight to fermentation vessels. However, if he wants *mixto* tequila (not 100% agave tequila), then the *agua miel* (honey water) must be placed in formulation tanks. Sugarcane or molasses sugar are then added to the juice. Only then can the *mixto* be placed in fermentation vessels. Now's the time alcohol begins to appear. Producers will introduce yeasts. These can either be chemical catalysts or natural ingredients. The tanks are lightly heated and carbon dioxide is released, giving the agave juice 5% alcohol content per volume. The *mosto*, or fermented agave juice, is finally ready for distillation. The juice will be heated to alcohol's vaporization point and then cooled and condensed to create *ordinario* (ordinary in English). Tequila is distilled to increase its alcohol content. Becomes *tequila blanco*. You could try to drink this *ordinario*, but chances are you'd be blinded and intoxicated afterwards! That is why Mexican law requires all tequila to be distilled twice. The *mosto* can be distilled three or even four times for top-shelf tequila. The first distillation will remove all "heads" and "tails", the first and last portions of the distilled product. These contain bad alcohols and other impurities, which is why they must be discarded in favor

of a quality (and safe) drink. A second distillation determines the percent of alcohol the tequila will have. Premium tequila will aim for 40% alcohol per volume. A bulk, mixto, or lower quality spirit instead aims for 55% alcohol per volume, which will be later diluted with purified water. Tequila then will be aged depending of the final product that is wanted.

There are five stages in the production of whiskey, malting, mashing, fermentation, distillation and maturation. Barley contains starch and it is this starch which needs to be converted into soluble sugars to make alcohol. For this to occur, the barley must undergo germination and this first part of the process is called ‘ malting’. Each distiller needs a type that produces high yields of soluble sugar. The barley is soaked for 2-3 days in warm water and then spread on the floor of a building called a malting house. When the barley has started to shoot, the germination has to be stopped by drying it. The barley is now called ‘ malt’ and this is ground down in a mill, with any husks and other debris being removed. Now we begin the “ mashing” step. The ground down malt, ‘ grist’, is now added to warm water to begin the extraction of the sugars. The liquid combination of malt and water is called the ‘ mash’. It is put into a large vessel called a mash tun and stirred for several hours. The liquid that comes out of that is called ‘ wort’. This process is normally carried out three times with the water temperature being increased each time to extract the maximum amount of sugar. Only wort from the first two times is used. The third lot is put back into the next batch of new grist. Any residue, such as husks, is called ‘ draff’. This is collected and used in the production of farm feed. “ Fermentation” begins when the wort is cooled and passed into large tanks called washbacks. These are

traditionally made of wood, but now a number of distilleries use stainless steel. Here the yeast is added and the fermentation begins. The yeast turns the sugars that are present into alcohol. As with the barley and water, the distiller will carefully select the strain of yeast that they use and it can also have a small effect on the final flavor of the spirit. The fermentation normally takes around 48 hours to run its natural course, although some distilleries will let it go for longer so as to create further characteristics that they require. The liquid at this stage is called ‘ wash’ and is low in alcohol strength (between 5-10% ABV), like beer or ale. Alcohols from the beginning of the distillation (called ‘ foreshots’) are very high in alcohol level and very pungent. Alcohols from the end (called ‘ feints’) are weak but also pungent. It is only the alcohol from the middle or ‘ heart’ of the distillation that is used and this is skillfully removed by a stillman and collected through the spirit safe. The foreshots and feints are then mixed with the next batch of low wines and re-distilled. The heart is the spirit that is then taken to be matured and that will become whisky. This ‘ heart’ has an alcoholic strength of 65-70% ABV. The final step is “ maturation”. The spirit is put into oak casks and stored. The most common types of oak casks are those that have previously been used in the American bourbon and Spanish sherry industries. The spirit must mature in casks for a minimum of three years before it is legally allowed to be called whisky in Scotland. During maturation, the flavors of the spirit combine with natural compounds in the wood cask and this gives the whisky its own characteristic flavor and aroma.

Why do people drink?



People resort to alcohol for many reasons. Some people drink it because they like the taste and feeling that alcohol gives them