



Unit IV - Topic 8
Defects and spoilage of Wines

Defects and spoilage

A beer fault or defect is flavor deterioration caused by the chemical change of organic matter in beer due either to improper production processes or storage. Some chemicals that cause flavor defects in beer, for example the aldehydes such as dactyl organic acids, lipids, and sulfur compounds can influence beer taste. Fermentation byproducts, with minor fluctuations of just over 1% above the threshold, can also have an impact on the flavor of the beer. When the concentration of one or more of these chemicals exceeds the standard threshold, the flavor characteristics of beer will change, creating a flavor defect.

Beer faults and wine faults

Improper production processes or storage also can create wine flavor defects. Wine defects are often due to the external environment which causes chemical changes in the composition of the wine. Poor sanitary conditions of the winery, dirty wine, excessive use of wine barrels, oak, cork, rot, and the influence of temperature fluctuations of the wine flavor can all create defects. Beer faults differ from wine faults because the chemical processes used to create them differ. In the brewing process for beer, the concentration of inorganic chemical elements can be too high or too low due to improper production. The malting process of joining malt and hops in the brewing process may cause microbial deterioration, which leads to the loss of beer flavor.

Diacetyl

Diacetyl is produced in yeast during fermentation and is reabsorbed in the process. Since the external ambient temperature during fermentation is lower than 26 °C (79 °F), diacetyl is absorbed insufficiently, resulting in a threshold of less than 0.04 mg/litre in beer, which gives the beer a mouthfeel like cream cheese. This odour will persist over time. Since the decomposition of α -acetolactate produces a large amount of diacetyl, the method can avoid the beer flavour defects caused by diacetyl as follows: boil the container and clean it before the yeast fermentation. The wort should avoid contact with oxygen when the fermentation begins. The temperature is raised by 2°-3° within 2 minutes of the end of the fermentation process, which allows the yeast to reabsorb faster so that the diacetyl content reaches 0.04 mg/L in the beer and does not cross the threshold.

Risotto taste

The reason for the taste of glutinous rice is that the content of diacetyl in the beer exceeds its taste threshold, and the beer produces a glutinous rice taste. The flavor threshold is also relatively low. For light-colored lagers, the diacetyl content preferably controls below 0.1 mg/L; for high-grade beer, it preferably controls below 0.05 mg/L. The solution is to increase the a-amino nitrogen content of the wort appropriately. Generally, the content of the 12P wort is controlled to be 180 ± 20 mg / L. Too low will lead to the synthesis and accumulation of a-acetic acid, lactic acid; too high will lead to excess nutrients in the yeast and excessive high alcohol content. Reduce the proliferation multiplication of yeast, generally the multiplication factor ≤ 3 . Because the precursors of diacetyl and other yeast metabolic by-products are mostly producing during yeast breeding, we can reduce the yeast proliferation rate by adopting a series of measures such as low-temperature inoculation, inoculum, and low-temperature fermentation. Properly increase the fermentation temperature in the late stage of the main fermentation.



Acids that cause beer fault

The acid produced during the fermentation of the raw materials of beer or the yeast produces natural acid when fermented, and is present in a large amount in beer. When it exceeds 170 mg/litre, it will create a strong sour taste of yogurt or pepper. Acids above the threshold are significant flavor defects in beer. A hygienic production environment, mashing the yeast strain for less than two hours, and keeping the fermentation temperature lower than 50 °C all help to reduce the amount of acid in beer. Brewing supplies and equipment should use non-marking equipment, because of the scratched fermentation device, bacteria will remain inside the scratches. These bacteria can cause yeast to be contaminated during fermentation.

Octanoic acid

Octanoic acid (caprylic acid) is a fatty acid produced by the metabolism of yeast during fermentation. When the content of octanoic acid in the beer exceeds 4-6 mg/L, the beer will have a highly concentrated spicy taste. Storage of beer in an environment below 26 °C (79 °F) will reduce this spicy taste. The use of fresh yeast and removal of the beer from the yeast cake immediately after the fermentation is completed will also keep the octanoic acid content within the threshold.

Butyric acid

Butyric acid is an acid produced by bacteria that produce syrup for a beer or that are mixed with oxygen during the production of wort to cause a decrease in Ph value. When the content of butyric acid in beer exceeds 2-3 mg/litre, the taste of beer tastes like metamorphic milk or rotten butter. Acidic sputum should be kept above 90 °F and avoid contact with oxygen. This method can avoid excessive butyric acid content. Beer production environment must be clean. External factors such as pollution can not monitor the syrup can also control the content of butyric acid.

Isovaleric acid

Isovaleric acid is an acid produced by mixing with octanoic acid in the oxidation of alpha acids in beer, which causes the beer to smell the odor. The acid is present in the beer at a level of from 0.7 to 1 mg per litre. A clean and hygienic production environment avoids the mixing of caprylic acid with isovaleric acid. Hops should be stored in an oxygen-free vacuum tight container to prevent bacterial infection.