

Detection Method of Adulteration of Edible Oil

Edible oil and adulteration

- Composition of edible oil

Edible oil is a high molecular compound triglyceride, which can be decomposed into glycerol and fatty acids after hydrolysis, providing all kinds of necessary energy for human life activities.



- Classification of edible oil

Traditional classification methods carry out oil classification based on the source of oil. Generally, the oil extracted from animals is called animal oil, while those extracted from plants is called vegetable oil. For vegetable oils, different types of vegetable oils can be extracted using leaching and pressing methods. Currently, peanuts, corn and soybeans are the main oil-extracting plants, and oil-producing tree species such as olives, coconuts, and palms are also good oil-generating materials. Animal oil is mainly obtained by processing and refining animal fats.

- Adulteration methods of edible oil

At present, the adulteration of edible oil can be divided into two types: (1) mix two different types of edible oil and sell the low-cost edible oil at a high price, so as to obtain the corresponding income; (2) for the sake of high cost and huge profits, some lawbreakers will also mix non-edible oils such as mineral oil into edible oil. these oils are mixed with a large number of refractory substances and harmful substances, which will have an extremely adverse impact on people's health.

Physical and chemical detection method for adulteration of edible oil

- Saponification method

When checking whether the cooking oil is doped with a certain amount of mineral oil, the saponification method is mainly used. The detection principle is that when the mineral oil encounters alkali, it can not be saponified, so the solution still has relatively obvious stratification. When alkali is added to the edible oil, the vegetable oil will appear more serious saponification phenomenon, and then mixed with water, making the solution show a relatively turbid state. According to the different reactions of the two, mineral oil and vegetable oil can be distinguished.

Detection of adulteration of edible oil by spectrometry

- Ultraviolet spectrophotometry

Different types of edible oil have different absorption wavelengths in the ultraviolet region. On this basis, using ultraviolet spectroscopy to perform various detection activities can

timely carry out the corresponding quantitative and qualitative analysis, which is of great significance to promote the rapid solution of problems.

- Near infrared spectroscopy

In the testing process, in addition to using ultraviolet spectroscopy to carry out various testing work, in the actual testing process, Near Infrared Spectroscopy will also be used to carry out various testing work. Generally speaking, the representative samples can be selected, and the spectral data and sample concentration data can be used to carry out the subsequent quantitative and qualitative detection, which is of great significance for the detection of adulteration effect of edible oil.

- Fluorescence spectroscopy

Fluorescence spectroscopy is also a method often used in the detection process. Because different types of edible oils have different fluorescence components, the adulteration of edible oils can be clearly shown in the detection process.

- Raman spectroscopy

Raman spectroscopy is a relatively advanced method. In the application process, through the investigation of molecular vibration information, the corresponding adulteration and other data can be obtained. By using this method, relatively accurate detection information can be obtained in a short time, at the same time, the detection effect is relatively good, the sample will not be damaged in the detection process, and the requirement of pre-treatment of the sample is also relatively low. Therefore, the matters needing attention in the process of carrying out its work are relatively few, and it is a relatively good detection method.

Chromatography

Chromatography is also a commonly used method for the detection of adulteration of edible oils. At present, gas chromatography and liquid chromatography are mainly used to carry out the detection work. In the process of using gas chromatography to carry out various detection work, the specific content of fatty acids in edible oil can be determined first. On this basis, combining it with relevant national standards, through comparative analysis, the adulteration of edible oil and the specific adulteration ratio, *etc.* can be judged.

Coupling method

In the process of adulteration of edible oil, in order to improve the efficiency of detection, multiple methods will also be used to detect the adulteration of edible oil at the same time, and the quality of its detection can be effectively guaranteed. On the basis of the combination of gas chromatography and liquid chromatography, the relevant researchers determined the adulteration proportion and the type of adulterated oil in sesame oil, and received a good detection effect, and the detection quality was effectively guaranteed. In the process of detection, some people combined HPLC and MS, and received relatively good detection results, and the detection quality was significantly improved.

Nuclear magnetic resonance method

Nuclear magnetic resonance (NMR) is also a commonly used method in the detection of edible oil. By detecting the absorption degree of radiation related to atomic nucleus in strong magnetic field, the substances in edible oil can be reasonably determined. On this basis, the corresponding material and molecular composition information can be obtained, which can effectively improve the detection quality. Using this method to detect the adulteration of soybean oil and sesame oil can determine the specific proportion of

adulterated oil and other related data, which is of great significance to promote the rational development of follow-up detection work.

Summary

The detection of edible oil is a relatively complex work, which can be used to detect the proportion of different types of edible oil and other data in time. It is of great significance to improve the detection quality.