NATIONAL STANDARD OF THE

PEOPLE'S REPUBLIC OF CHINA

GB 31664-2025

National food safety standard - Code of practice for the control of 3-chloropropanol esters and glycidyl esters in food

食品安全国家标准 食品中3-氯丙醇酯和缩水甘油酯污染控制规范

Issued on: September 2, 2025 **Implemented on: September 2, 2026**

Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC

Table of Contents

1 Scope

The standard lays down the basic requirements and the management principles for controlling 3-chloropropanol esters and glycidyl esters during the production of refined edible oils and during the processing of foods made from them.

It applies to the control of 3-chloropropanol ester and glycidyl ester contamination during the production and use of refined edible oils, including edible vegetable oils and fish oils.

2 Production of refined edible oils

2.1 Raw materials. Edible vegetable oil-bearing materials shall meet GB 19641. Edible vegetable oil-bearing materials should be stored at a relatively low temperature, for instance below 25 °C, under dry conditions, and processed as soon as possible. Edible vegetable oil-bearing materials and fish oil raw materials should be tested for chlorinated compounds, and raw materials with a low chloride ion content should be chosen as far as possible.

2.2 Oil production. Edible vegetable oil-bearing materials shall be pre-treated promptly by a process suited to their characteristics, and the temperature, time and other conditions shall be controlled during cooking. The introduction of chlorinated compounds during pressing and solvent extraction shall be avoided; for example, chloride-containing brine shall not be used when meal fines are removed from crude oil by settling. In solvent extraction, negative pressure evaporation and stripping may be used to lower the temperature at which the miscella is handled.

2.3 Refining. The precursors in crude vegetable oil or fish oil, such as diglycerides and chlorinated compounds, should be assessed, and crude vegetable oil or fish oil with a low content of precursors and free fatty acids should be chosen. The chloride ion brought in by water, acid, alkali, adsorbents and similar inputs should be monitored, so as to reduce or avoid the introduction of chlorinated compounds at each refining step and thereby lower the

chloride ion content of the oil. Degumming shall be carried out under weakly acidic conditions in order to reduce the 3-chloropropanol esters in the vegetable oil or fish oil; where direct water degumming or enzymatic degumming is chosen, degumming with a low concentration of phosphoric acid or citric acid should be used, and the degumming temperature should be controlled so as to reduce the formation of 3-chloropropanol ester precursors during degumming. In deacidification a suitable method shall be chosen to remove the precursors mentioned above and to lower the free fatty acid content, so that the deodorizing temperature of the vegetable oil or fish oil can be lowered; chemical methods such as alkali refining, biological methods such as enzymatic treatment, and physical methods such as steam distillation and molecular distillation may be used. During deodorizing the temperature and time shall be controlled, and deodorizing shall be carried out at a relatively low temperature, for instance not above 240 °C for vegetable oil and not above 190 °C for fish oil, so as to reduce the formation of glycidyl esters; the deodorizing temperature may be lowered by increasing the quantity of steam, raising the vacuum and speeding up the evaporation of volatile compounds. A combination of low temperature for a long time and high temperature for a short time should be used, so as to shorten the time spent deodorizing at high temperature. Processing aids complying with the national food safety standards shall be used in order to reduce glycidyl esters, and where necessary the chloride ion content of the processing aids shall be controlled. Crude vegetable oil or fish oil with a comparatively high content of 3-chloropropanol esters and glycidyl esters may be treated by molecular distillation to remove them. Where glycidyl esters have been removed from crude vegetable oil or fish oil by adsorbent treatment, a further deodorizing step shall be carried out where necessary.

3 Use of edible vegetable oils and fish oils in food processing

3.1 Edible vegetable oils and fish oils with a low content of 3-chloropropanol esters and glycidyl esters should be chosen for food processing.

3.2 Enterprises making infant and follow-on formula foods that use edible vegetable oils and fish oils shall check the test report for the content of 3-chloropropanol esters and glycidyl esters.

3.3 The frying temperature during food processing shall be controlled and excessively long frying shall be avoided. Frying oil shall be replaced in good time and repeated use shall be avoided.

3.4 When grilled or fried foods are made, the use of salt or salted foods should be reduced, for instance by using low-salt ingredients, and salt should be added after cooking and heating are complete.