CLAIMS

1. Process for refining vegetable oil, to suppress the formation of monochloropropanediol esters (MCPDe) and reduce the content of glycidyl esters, comprising first and second refinement stages,

wherein the first refinement stage comprises the steps of:

a) providing a crude vegetable oil having a combined MCPDe and glycidyl ester content below 0.2 ppm, preferably below 0.1 ppm;

b) degumming the crude vegetable oil to produced degummed vegetable oil;

c) bleaching of the degummed vegetable oil with activated bleaching earth under reduced pressure to yield bleached vegetable oil, preferably at a reduced pressure of 80-800 mbar;

d) adding a base to the bleached vegetable oil and subsequent stripping and deodorizing under reduced pressure at a temperature below 255 °C to yield an intermediate refined vegetable oil;

and subsequently a second refinement stage comprising the steps of:

e) bleaching of the intermediate refined vegetable oil using activated bleaching earth under reduced pressure to yield a bleached vegetable oil, preferably at a reduced pressure of 80-800 mbar; and

f) deodorizing at a temperature below 220 °C to yield fully refined vegetable oil, preferably at a reduced pressure below 5 mbar;

wherein the fully refined vegetable oil has a combined MCPDe and glycidyl ester content below 4 ppm.

2. Process according to claim 1, wherein the fully refined vegetable oil has a combined MCPDe and glycidyl ester content below 2 ppm, preferably below 1.75 ppm, such as below 1.5 ppm.

3. Process according to claim 1 or claim 2, wherein the combined MCPDe and glycidyl ester content comprises less than 0.5 ppm 2-MCPDe, less than 1 ppm 3-MCPDe and less than 0.5 ppm glycidyl esters.

4. Process according to any one of the preceding claims, wherein the fully refined vegetable oil has a combined 2-MCPDe and 3-MCPDe content of below 2 ppm, preferably below 1.5 ppm.

5. Process according to any one of the preceding claims, wherein the fully refined vegetable oil has a glycidyl ester content of below 2 ppm, preferably below 0.5 ppm.

6. Process according to any one of the preceding claims, wherein the degumming step b) is water degumming, or an acid degumming step using a non-chloride-containing acid, preferably phosphoric acid, citric acid or malic acid or mixtures thereof.

7. Process according to any one of the preceding claims, wherein the base in step d) is selected from the group consisting of sodium methoxide, sodium hydroxide, potassium hydroxide, sodium carbonate, sodium bicarbonate, potassium carbonate, potassium bicarbonate, sodium salts of fatty acids, potassium salts of fatty acids, calcium salts of fatty acids, and mixtures thereof.

8. Process according to claim 7, wherein the base is potassium hydroxide.

9. Process according to claim 7 or claim 8, wherein the amount of base is between 10 and 50 ppm based on the weight of the oil, preferably between 15 and 25 ppm.

10. Process according to any one of the preceding claims, wherein the temperature in step d) is from 210 to 255°C, preferably from 230 to 250 °C.

11. Process according to any one of the preceding claims, wherein the stripping in step d) is performed using steam.

12. Process according to any one of the preceding claims, wherein the deodorization in step d) is carried out at a reduced pressure of less than 10 mbar, preferably less than 5 mbar, more preferably less than 2 mbar.

13. Process according to any one of the preceding claims, wherein the bleaching in step e) is carried out at a temperature between 80 and 130 °C, in the presence of 0.3-0.8 % by weight of bleaching earth, preferably for a time of 0.3 to 1 hour.

14. Process according to any one of the preceding claims, wherein the deodorizing in step f) is carried out at a temperature of below 220°C, or below 200°C, more preferably between 150 and 180°C.