

ALIEN PROPERTY CUSTODIAN

PREPARATION OF FATS AND OILS ADAPTED FOR HUMAN CONSUMPTION

Arthur Imhausen, Witten/Ruhr, Germany; vested in the Alien Property Custodian

No Drawing. Application filed October 24, 1940

The object of the present invention is the preparation of fats and oils adapted for human consumption from synthetic fatty acids which have been produced from suitable hydrocarbons. All paraffin and paraffin-like compounds of aliphatic nature may be used in which aromatic substances, naphthenes and the like, are not present or have previously been removed, as for instance petroleum-paraffin, hydrogenated low burning paraffin, hydrogenation products of carbon oxides and the like. Fatty acids of a very brought band, i. e. fatty acids extending from about C₄ to C₂₂ are produced. According to whether solid fats or oils adapted for human consumption are to be prepared, higher or lower portions are used, for the production of oil, adapted for human consumption, for instance, the portions from C₄ to about C₁₂ are used, whereas, for solid fats, adapted for human consumption, substantially the acids from C₁₀ to C₂₂ atoms in the carbon chain of the molecule are employed.

The fatty acids are esterified with glycerin in a vacuum which in accordance with known methods preferably may be effected with the addition of catalyzers, for instance zinc etc. After esterification the fat, however, is not yet ready for human consumption. If fats used for human consumption are produced from natural oils and fats, a deodorizing is effected which removes the odor-and taste carriers. This also is the case with fats which are obtained by esterification of olive oil-fatty acids, as is the practice for instance in the countries of the Mediterranean Sea. The undesired accompanying bodies of the fat produced from synthetic fatty acids, however, differ from these in many respects. In connection with synthetic fats, deodorizing in the ordinary sense and at the ordinary times is not effective in obtaining the purpose aimed at.

Now, it has been recognized that the purpose aimed at, i.e. the production of synthetic fats adapted for human consumption and free of taste, may be obtained, if the damping is carried out until compounds are no longer present which have an ester number. The invention, therefore, consists in a method for the production of oils and fats, adapted for human consumption, by esterification of fatty acids, obtained by the oxidation of hydrocarbons, with glycerin and subsequent refining of the raw ester, said raw fats being subjected to a distillation which in accordance with the present invention is continued until sampling after saponification, extraction with ether of the small portions of the unsaponifiable substances and decomposition of the soap

with a mineral acid result in a fatty acid the ester number of which is practically 0. Under these compounds, of course, not the glycerin ester of the synthetic fatty acids is to be understood but those compounds having an ester number which partly results from the production of the synthetic fatty acid and partly are formed later on. These substances are for instance aldehydes, ketones, lactones, estolides and, moreover, esters of fatty acids with aliphatic alcohols.

The tests, whether a fat adapted for human consumption has a "foreign ester number" is carried out as follows:

The fat is saponified, the small portions of the unsaponifiable substances are extracted with ether and the soap is decomposed with deluted mineral acid. Of the fatty acids so obtained the ester number is determined. In accordance with the invention it must be 0 or about 0. Hitherto the quality of fats adapted for human consumption has been judged or estimated according to taste and odor. As is evident, however, these characteristics are rather individual. Therefore, the fact of having found a clear characteristic for the quality of a synthetically produced fat, adapted for human consumption, must be considered a great advance in the art.

Examples

(1). Raw fatty acids which have been produced from carbon oxide-hydrogenation products by oxidation with molecular oxygen are subjected to a fractionated distillation. The portions boiling between about 150 to 280° C (2 to 5 mm vacuum) are separately caught.

100 kgs of these distillate-fatty acids are esterified with 15 kgs of glycerin in a vacuum vessel, whereby, in accordance with the boiling limits of the fatty acids, temperatures up to about 240° C are required. For the purpose of acceleration 1/2% of zinc powder is added. When an acid number of about 3 is obtained, a damping is effected. The latter is continued until a sample of a fat, adapted for human consumption, shows that besides the glycerin ester of the fatty acids no compounds are contained therein which also have an ester number. The fat then is refined in the usual manner with alkali, filtered and preferably again subjected to a damping. The method may also be so carried out that the first damping is not continued until the disturbing secondary compounds are completely removed, but that the last rest of these compounds is removed by the second damping.

The fat obtained is a light, solid fat adapted

for human consumption which has an agreeable taste without any odor. In a comparison test the same fatty acid ester was dampened for a shorter period of time so that a residual ester number of 3 was still present in the fat adapted for human consumption. This fat had a disagreeable harsh taste.

(2). Raw fatty acids of products of low temperature hydrogenation of low boiling products obtained by oxidation are subjected to a vacuum distillation and the portions having a carbon number of about C₄ to C₁₂ are separately caught.

100 kgs of this fatty acid are esterified in a vacuum still with 22 kgs of glycerin until an acid number of 5 is obtained. The ester then is refined with a lye and treated with bleaching earth. The ester thereupon is introduced into a damping apparatus in which finely distributed superheated steam is introduced in the fat in a vacuum. Hereby the disagreeable secondary compounds are distilled off. Damping is carried out until the ester number 0 is obtained.

ARTHUR IMHAUSEN.