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STABILIZED FATS AND OILS

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This application relates to fats and oils, and particularly novel types of fats and oils or blends thereof having distinct advantages over and differences from the fats and oils now available on the market.

For many years the blending of various grades of oils, both refined and virgin, treated and untreated oils and fats, has been recognized as an art, and involves careful considerations just as in the blending of teas, perfumes, and similar articles. By means of such blending operations, modified oils of varying flavor have been produced, available for example for salad and cooking purposes. For example, on the continent in Europe, special table oils and margarines have been produced by means of the blending of certain grades of available oils, such as olive, peanut, and sesame oils, particularly to produce a more uniform type of oil by such admixture. In each instance of blending, however, the oils have been first crushed from the seed, nut or fruit, and subsequently admixed or blended and retained in their virgin or untreated state if so desired, or in other instances subsequently refined and blended after refining. Thus a blend of virgin olive oil may be made by mixing several of the many types produced in the Mediterranean regions; or a blend may be made of 60% of blended virgin olive oil with 40% refined olive oil; or mixtures of many different vegetable oils may be produced, etc. Such mixtures or blends of oils and fats as have thus been produced in the prior art are well known, but in all such cases, the characteristics of the resulting blend is usually a mere summation of the characteristics of the individual oils or fats that enter into the admixture.

Among the objects of the present invention is the production of novel types of oils and fats, particularly of edible characteristics, which are substantially different from such prior art blends as those described above.

Further objects of the present invention include the production of such modified oils and/or fats, which have a marked resistance to rancidity substantially beyond that exhibited by the oils and/or fats of the prior art.

Still further objects include the production of oils and/or fats of entirely new flavors and characteristics.

Still further objects and advantages will appear from the more detailed description set forth below, it being understood, however, that this more detailed description is given by way of illustration and explanation only and not by way of limitation, since various changes therein may be made by those skilled in the art without departing from the scope and spirit of the present invention.

In a copending application, Serial No. 696,915 filed November 6, 1933, there has been disclosed the incorporation of crushed sesame seed in various oils and/or fats and with or without subsequent filtration of the seed cake from the treated oil to produce new types of flavored and differently constituted fats or oils having unusual keeping qualities resistant to development of rancidity, and exhibiting novel characteristics in regard to flavor, odor, etc.

As set forth in that companion application, the crushed sesame seed without segregation of oil from the cake is desirably incorporated with the oil and/or fat to impart thereto remarkably improved keeping qualities making the resulting products substantially resistant to development of rancidity, and markedly changing the flavor and odor and other desirable characteristics of the products. In such treatment, the crushed sesame seed may be permitted to remain with the oil treated, or after a relatively short treatment, such as for 15 minutes at moderate temperatures, such as approximately 150° F., the sesame seed fibers may be filtered off or otherwise removed from the treated oil, the latter still exhibiting marked keeping qualities and modified flavor and odor, yielding at the same time a seed cake of valuable edible characteristics not alone for the ordinary purposes for which seed cakes are employed, but also because of the manner of treatment, available for human consumption. As there pointed out, the sesame seed in ground condition retaining the oil with the seed fiber, may be added in an amount of 5 to 10% to the desired oil and/or fat, or mixture of oils and/or fats, and need not in any instance exceed 20% in the amount added, although of course higher quantities may be utilized if desired. Among the oils that are exemplified for treatment in this way there are included cottonseed oil, such as ordinary winter pressed deodorized cottonseed salad oils, straight refined deodorized 76° cocoanut oil, and similar oils, as well as the usual types of hydrogenated shortenings. As pointed out such treated oils very markedly increase their resistance to development of rancidity, show a marked decrease in the development of fatty acid content on standing, etc.

It has further been found that many seeds and nuts in addition to sesame seed may be employed for improving the keeping qualities of such oils

and fats, particularly of the edible type, and also for modifying desirably the taste, flavor and odor of such oils and fats, as well as other characteristics, and actually results in the production of entirely novel types of oils and/or fats.

Thus it has been found that various types of nuts, seeds and fruits from which oils are obtainable may be utilized including peanuts, sunflower seed, poppyseed, linseed, cocoanuts, etc. Of course, it is to be understood that identical results are not secured by the use of any and all of these various seeds, nuts or fruits, but it should be noted that any of them may be utilized in accordance with the teachings of the present invention to secure desirable modification of flavor, odor, taste, keeping qualities, etc. in connection with these various oils and/or fats as herein taught.

As illustrating the invention, ground peanuts may be utilized in the treatment of a refined deodorized (substantial neutral taste and odor) vegetable oil, mixing for example 5% of the ground peanuts with 95% of the vegetable oil. The mixture may be heated at a moderate temperature, such as 150° F. for a short time, as for example 15 to 30 minutes, and after such treatment, the seed or other fibers filtered or centrifuged from the admixture. There is thus obtained an oil of decidedly new and pleasant flavor, possessing unusual and unexpected characteristics, leaving a residuary cake of important edible characteristics.

The oil thus obtained exhibits a distinctive flavor wholly unlike straight peanut oil, and entirely different from any available blend of peanut and cottonseed oils. The keeping quality of the resultant oil is far superior to that of even straight peanut oil, keeping without any substantial rancidity for from two to three times longer than any blend prepared from the oils mentioned, and not made by infusion of one of the oils with the stated nuts.

It should be noted that the resultant oil obtained by the treatment set forth above is quite distinct from that resulting by crushing ground peanuts to remove the oil and blending of such oil with straight cottonseed oil in similar proportions, the latter possessing neither the flavor, odor, keeping qualities or other characteristics of the cottonseed oil produced as given above by direct infusion with the peanuts. By actual contact of the vegetable oil, such as cottonseed oil as noted above, with the ground nuts, there is a modification of characteristics of the oil that is obtainable only by such direct contact of the ground nuts with the oil, producing not only new flavors, but a finished oil superior in every way to the ordinary oil or blended oil obtained in the usual way.

These methods may also be employed in the production of concentrated blends with a minimum of cost. For example, French peanut oil produced from the Rufisque peanuts, costs in the present market over twice that of cottonseed oil because of the fine flavor and keeping quality of the French peanut oil. However, an oil obtained by infusion of only 5% of such ground peanuts as explained above in accordance with the present invention is superior even to that of Rufisque peanut oil, and possesses a more substantial and pleasant flavor, combining all desirable characteristics.

As a further example, mixtures of crushed sunflower seed with vegetable oils and hydrogenated shortenings have been produced, resulting in oils possessing strangely different flavors and far different from sunflower seed oil. Such modified oils produced by infusion with crushed sunflower seed possess not only distinctiveness in flavor and odor and long keeping quality, but there is imparted to the finished oils a type of gumminess, in this particular instance, that makes it of unusual significance to mayonnaise manufacturers who are desirous of maintaining their emulsion under the most trying circumstances, and for whom even the same percentages of ordinary sunflower oil would not accomplish the desired results.

In the utilization of seeds, nuts, or fruits, these may be dehulled or deshelled as desired, as for example, in the treatment of the sesame seed which may be subjected to the usual blanching operation to remove the shell or hull. Before grinding such blanched, or dehulled or deshelled nuts may be dried preferably at relatively low or only moderate temperatures, such as 150° F. Of course, higher temperatures will yield a slight roast, and temperatures are employed desirably which are insufficient to give the seed or nut a burnt flavor, such temperatures, however, being sufficient to break down the cell structure and aid in the removal of moisture, while retaining all of the sweetness of the original seed or nut. Higher temperatures may be employed where a burnt flavor is desired, but this is not necessary nor even generally desirable in carrying out the present invention.

The treated oils and/or fats may be utilized without removal of the seed fibers therefrom, but it is quite remarkable and noteworthy that the removal of the seed fibers or seed cake from the treated oil leaves a residual oil of noteworthy characteristics as to flavor, taste, odor and keeping qualities, as indicated above.

The recovered seed cake is a desirable product and has greatly superior qualities from an edible standpoint than does the ordinary seed cake remaining by crushing seeds for removal of oil. Due to oil that still remains in such seed cake, the product is essentially distinct in characteristics from the ordinary seed cakes remaining after the crushing of seeds to produce oils. Such modified characteristics of the seed cakes resulting from the present invention are due in part to the fact that not only is there residual oil in such seed cakes that has not been removed, but part of the original oil present in such seeds has been replaced by the oil or fat that has been employed in the treatments referred to, giving novel types of seed cakes. Such seed cakes after separation from the oil undergoing treatment may, of course, be utilized by pressing or otherwise to remove additional quantities of oil therefrom.

The oils resulting from treatment in accordance with the present invention may be utilized for blending with other oils and/or fats, and to impart thereto characteristics obtained as a result of the infusion method set forth herein. Other methods of making extracts of the desirable constituents of the seeds, nuts or fruits may be utilized as for example by the treatment of the crushed seeds, etc. by volatile or other solvents, which are then incorporated with the desired oils and/or fats. But desirably the process is carried out by direct infusion of the seed, etc. with the edible oil or fat as explained above.

The term "seed" is employed in the appended claims to cover seeds, nuts and fruits employed in accordance with the present invention, such

seeds, nuts and fruits being those which are generally recognized to contain oils of desirable characteristics.

While the use of this invention has been particularly emphasized above in connection with edible oils and fats, it is not limited in its application in that way, but may be utilized in connection with the modification of properties of oils and fats other than edible oils, and also and particularly to prevent rancidity or to inhibit the development of rancidity in various types of oils and fats other than edible oils. For example, the invention may be utilized in connection with prevention of rancidity in coffee due to changes in the oil present in the coffee bean. Crushed sesame seed, or other crushed seeds as indicated above, may be added to the coffee beans during roasting and grinding operations, or in any other way brought into intimate contact with the coffee oil in order to protect such oil against development of rancidity. Or if desired, the roasted coffee bean might be treated with an extract of crushed seeds containing the substances which tend to inhibit development of rancidity in oils.

As a further example of the utilization of the invention in connection with non-edible products, reference may be made to the prevention of development of rancidity in the so-called super-fatted soaps. A small quantity of the crushed sesame seed, or any of the other crushed seeds referred to above as desired, or extracts of those seeds as desired, may be added to the soap composition either in the crutcher or just before the finishing of the soap, yielding products which tend to prevent the development of rancidity that makes such super-fatted soaps free from their usual tendencies toward or danger of development of rancidity.

The treatment of the oils as set forth above, either by actual incorporation of the seed, fruit or nut product into the oil, or by extraction from such seed, nut, or fruit by means of the oil, imparts to the oil substantial protection against the development of rancidity. It is believed that such protection is obtained by actual transfer of substances from the seed, fruit or nut to the oil which is treated. For example, it has been found that much more satisfactory results are obtained by the method set forth above than is secured by crushing oil from the seed, nut or fruit products, and utilizing such oil for admixture with the oil to be treated. It is preferred, therefore, in imparting the properties of resisting rancidity to edible oils or other oil, to utilize either the actual incorporation of the crushed seed, fruit or nut with the edible or similar oil, or to utilize the edible or similar oil which is to be protected against rancidity, as the medium for making the extraction of desirable substances from the seed, nut or fruit. While as noted above, it is believed that such protection is obtained by actual transfer of substances from the seed, fruit or nut to the oil which is treated, for present purposes, it is immaterial what the basis of that protection is, since by carrying out the invention as set forth herein, actual protection is thus secured.

And as noted, it is not only that the anti-rancidifying substances which are removed from the very cake itself and transferred into the oil normally subject to rancidity, so that the resulting product is substantially free from the objectionable feature that edible oils and fats normally exhibit, but such treated oils also exhibit the peculiarly pleasant, sweet odor and flavor that are obtained as the result of the addition of or infusion from the seed, fruit or nut. This is well illustrated by the fact that fully hydrogenated shortenings containing these infusions, or otherwise modified in accordance with this invention, have provoked the comments of users that such materials exhibit a fine, freshly rendered lard odor, without any of the objectionable characteristics that lard usually takes on. This is important since lard itself and the odor of lard is usually looked upon as being desirable in the production of a desirable finished product as a baking compound.

Further it should be noted that the teachings of the present invention may be utilized desirably in connection with animal fats and oils, or related products, such as for example lard, which may be infused or otherwise treated with the seed, nut or fruit products in accordance with the present invention to yield a final modified lard or similar products of superior keeping qualities, superior not only to lard ordinarily, but even to that of the cottonseed oil products. The importance of this is shown by the fact that the lard industry for the past ten years has been seriously affected by two factors, the first that the use of vegetable products has been increasing, and secondly because although the shortening value of lard is recognized as superior to similar vegetable oil products,—meaning by shortening value creaming quality, water absorption, and similar facts that influence cake baking, pie baking, etc.—the keeping quality of lard is so much inferior that it can be employed only for the cheaper type of commodities. This is one reason at least why lard today is selling at a price from 25 to 30% under that of the fully hydrogenated cottonseed shortenings. The infusion of the lard with the seed, nut or fruit products, or the incorporation of the seed, nut or fruit material with the lard, in accordance with the present invention, yields a lard of far superior keeping qualities as noted above, with only a very nominal and small increase in cost of production. It has been found for example that the resistance to development of rancidity of lard thus treated is substantially increased by two or three times that of untreated lard. Using as little as 3% of the crushed oil meal without filtering off the meal will reduce the tendency to rancidity by double the period of time than if the cake were removed by filtration.

The invention may similarly be applied to butter. And further it should be noted that butter oil itself, as distinguished from ordinary butter, which butter oil ordinarily develops a strong rancid-like odor within three hours when placed in an incubator at 180° F., if first treated with as little as a 3% infusion in accordance with the present invention, yields a butter oil that does not show any such rancid-like odor even after fifteen hours' treatment at the temperature stated.

It has been found that a small percentage of oil cake contains such a substantial concentration of those substances that inhibit rancidity that it may be used and re-used without substantially diminishing its activity. For instance, after infusion of an oil cake in cottonseed oil shortening and after subsequent filtration of the oil cake rancidity will have been inhibited in the cottonseed oil shortening to a noticeable degree.

The residuary cake may be used again, but this second time in order to gain its maximum protection it should be allowed to remain in contact with

the shortening so that when used for baking or similar purposes the intimate contact of the meal with the fat will act in a more concentrated form to protect the shortening from rancidity.

By adopting this method the oil cake becomes less expensive to use since it may first be used for ordinary infusion and subsequent filtration and may, secondly, be used where filtration of the meal is not required.

The invention may also be applied in the treatment of paint oils. These and other facts set forth above emphasize the important results obtained in accordance with the present invention.

The term "refined" as used herein designates a non-virgin oil, or an oil which at least partially refined requires no substantial treatment for use, (after protection against rancidity in accordance with the present invention) which would completely destroy the anti-rancidity protection.

By direct infusion is meant the direct contact of the oil with the seed.

Having thus set forth my invention I claim:

1. A refined glyceride selected from the group consisting of oils and fats subject to rancidity carrying a small percentage of a direct infusion of an oil containing seed including anti-rancidity constituents sufficient to inhibit substantial rancidity in said glyceride, the glyceride being substantially free from seed fibers.

2. A refined glyceride selected from the group consisting of fats and oils subject to rancidity carrying a small percentage of a direct infusion of an oil containing seed containing oil dissimilar to the glyceride, and including anti-rancidity constituents sufficient to inhibit substantial rancidity in said glyceride, the infused glyceride being substantially free from seed fibers.

3. An edible refined glyceride selected from the group consisting of fats and oils subject to rancidity carrying a small percentage of a direct infusion of not more than 20% of a crushed oil-containing seed including anti-rancidity constituents, sufficient to inhibit substantial rancidity in said glyceride, substantially free from seed fibers.

4. A refined cottonseed oil subject to rancidity carrying a small percentage of a direct infusion of an oil-containing seed including anti-rancidity constituents sufficient to inhibit substantial rancidity in said oil, the infused oil being substantially free from seed fibers.

5. A refined cocoanut oil subject to rancidity carrying a small percentage of a direct infusion of an oil-containing seed including anti-rancidity constituents sufficient to inhibit substantial rancidity in said oil, the infused oil being substantially free from seed fibers.

6. A refined glyceride selected from the group consisting of hydrogenated edible oils and fats subject to rancidity carrying a small percentage of a direct infusion of an oil-containing seed including anti-rancidity constituents sufficient to inhibit substantial rancidity in said glyceride, the infused glyceride being substantially free from seed fibers.

7. The method of inhibiting rancidity in fats and oils normally subject to rancidity which comprises mixing a refined glyceride selected from the group consisting of fats and oils subject to rancidity with a small percentage of an oil-containing seed including anti-rancidity constituents sufficient to inhibit substantial rancidity in such glyceride, producing a direct infusion of said seed in said glyceride, and separating the treated glyceride from the seed fibers.

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