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MARGARINE OIL AND MARGARINE MADE THEREFROM

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This application is a continuation-in-part of our copending application, Serial No. 279,596, filed May 10, 1963, which has now been abandoned. The present invention relates to a specific improved margarine oil and to a method of producing such an oil.

In the past, numerous formulations for margarine oils and margarines have been developed and it is known to rearrange various oils to produce a suitable material to which modifiers may be added to provide the basic oil or fat which constitutes the principal portion of the final margarine.

It is desirable to provide such an oil which does not become brittle at refrigerator temperatures, which does not have a waxy taste, and which is resistant to rancidity and has excellent flavor and odor. It is also highly desirable that there be present a substantial amount of the lauric oils to assist in imparting the desirable properties to the margarine oil. Accordingly, attempts have been made to devise such an oil. For instance, a mixture was made of a coconut type oil with a highly unsaturated vegetable oil and short chain triglyceride, and the mixture was subsequently interesterified to the desired point. In some cases a small amount of tristearin or the like was added. While the final product was fairly satisfactory, certain difficulties were encountered in the manufacture thereof and it involved increased costs.

In another process, a hydrogenated unsaturated vegetable oil was mixed with a coconut oil and the mixture was rearranged. Such products had Wiley melting points which were too low for the desired properties, tended to become brittle at refrigerator temperatures, and at normal room temperatures the product had the consistency of vaseline.

Another prior art process involved the corandomization of a cononut oil and a high melting hydrogenated marine oil or vegetable oil. A minor amount of unhydrogenated coconut oil was added to this corandomized oil product. Such products normally had too low a penetration at both refrigerator and ambient temperatures. Also the product tended to have a waxy consistency which was quite undesirable from the standpoint of feel and taste.

The present invention is intended and adapted to overcome the deficiences inherent in prior oils of the above described type, it being among the objects thereof to provide a margarine oil which has better spreadability at refrigerator temperatures than previous oils containing substantial amounts of coconut type oil elements.

It is also among the objects of the invention to utilize unhydrogenated or only partly hydrogenated highly unsaturated oils in order to increase the nutritional value of the final product.

It is further among the objects of the invention to provide an oil of the stated character which has a smoother texture than prior oils containing coconut type oils, which melts smoothly in the mouth, which has a pleasant odor and taste, and which is not waxy or grainy or of vaseline-like consistency.

Applicants have found that certain specific combinations of initial oil, rearranging oil and additives produce a margarine of unexpectedly superior properties having the desirable characteristics usually sought for in compositions of this kind.

The invention is based on the discovery that the introduction into a margarine, containing substantial amounts of a coconut type oil, of a hydrogenated coconut type oil will in combination with certain other constituents provide all of the highly desirable properties of the final oil which are contemplated by the present invention. The amount of the hydrogenated coconut oil is quite small being a minor part of the composition and usually not over about 20% thereof.

More specifically, in operation, the coconut type oil is rearranged with a vegetable oil which is liquid at room temperatures. Suitable oils are peanut, corn, cottonseed, soya, safflower and sesame. The coconut type oil may be any of the oils usually placed in that class, including coconut itself, palm kernel, babassu, tucum and cohune. Coconut type oils are characterized by the presence of substantial amounts of lauric acid, and are often, for this reason called lauric acid oils.

It has been found preferable to maintain the coconut type oil-vegetable oil ratio between 1 to 1 and 10 to 1. The preferred ratios are about 65 to 80 parts of the coconut type oil and about 35 to 20 parts of the liquid vegetable oil. In addition, certain modifying agents are physically added to control the consistency of the final product in the range of temperatures between those found in the refrigerator and those normally encountered in a room. Such modifying agents may be cottonseed stearine, palm stearine, and/or tripalmitin and the like. The modifying agent or additive is hereinafter defined as a stearine or triglyceride of higher fatty acids having 16 or more carbon atoms and resembling tristearine in its solid fat content.

The vegetable oil used may be partially hydrogenated and the base oil should preferably have a Wiley melting point of 73° to 80° F. and a setting point of 15° to 20° C. After modification of the oil as a result of the physical addition hereinbefore referred to, the Wiley melting point should preferably range from 84° to 102° F. and the setting point from 22° to 26° C.

While the temperature ranges set forth herein are important in that they produce the most superior results, nevertheless it is not absolutely essential that either the base oil or the finished oil be maintained precisely within them.

To more specifically set forth the manner of practicing this invention, the following examples are set forth, as illustrative of the nature of the invention without limiting the scope thereof.

EXAMPLE 1

2800 grams of refined bleached palm kernel oil, and 1200 grams of refined bleached peanut oil are charged in a three neck, five liter flask, equipped with a mechanical agitator, thermometer, nitrogen inlet and vacuum takeoff. The charge is heated to 90° to 100° C. under full vacuum (approximately 2 to 5 mm.) to remove all traces of moisture. This temperature is maintained for approximately 30 minutes for this purpose.

The vacuum is then broken with nitrogen and 0.3% sodium methylate is carefully added. Atmospheric pressure is maintained with the nitrogen blanket for approximately 15 minutes with a temperature continuing at 90° to 100° C. The mixture will change color from a pale yellow to a dark brown, indicating that rearrangement is taking place.

The rearranged mixture is then transferred to a large container and washed three times with an equal volume of water at about 90° C. The oil is then vacuum dried and 0.5 to 1.0% activated charcoal as well as 0.5 to 1.0% "filter cell" are added. The oil is then re-dried and bleached under full vacuum at 90° to 100° C. As a final step, the oil is vacuum filtered.

This oil resulted in a Wiley melting point of 75.5° F. and a setting point of 18.6° C.

The same procedure was used in the examples set forth in the following table, using the oils indicated therein and obtaining the Wiley melting points and setting points therein set forth.

amount of hydrogenated coconut oil is near the maximum of 20%, say 15% and 20%. The increased amount over about 15% has the effect of the omitted stearine.

The finished oils as set forth in the previous examples were made up into margarines, using various formulations as typified by the following example.

Table I.—Rearranged Oil Compositions

	A	B	C	D	E	F	G	H	I	J
Percent Palm Kernel Oil	50	70			70	24				30
Percent Coconut Oil			70	70		22		75	50	
Percent Babassu Oil						24	65			40
Percent Peanut Oil	50	30	30							10
Percent Safflower Oil						30				
Percent Corn Oil					30				50	
Percent Soybean Oil							35			20
Percent Cottonseed Oil								25		
Percent 87 I.V. Hydrog. Peanut Oil				30						
Melt. Pt. Wiley, °F	73.4	75.4	77.4	77.6	74.8	75.4	74.8	79.6	75.1	76.3
Setting Pt. °C	15.2	18.6	17.2	19.6	18.8	17.4	16.9	19.1	15.0	18.8

EXAMPLE 2

The finished oil was produced by charging 89% (3560 grams) rearranged base oil, as set forth in Example 1, 8% (320 grams) 100° melting point Wiley palm kernel oily and 3% (120 grams) tripalmitin in a three necked, 12 liter flask equipped with a steam sparger, thermometer and vacuum takeoff.

The charge was heated under full vacuum (2 to 5 mm.) to a temperature of 210° to 220° C. The temperature was maintained under full vacuum for three hours while the charge was blown with steam. This is to remove methyl esters and other volatile impurities. The batch is then cooled and refiltered and on test indicated a Wiley melting point of 95.0° F. and a setting point of 23.2° C.

The same procedure was used to make the various finished oil compositions as set forth in the following table.

EXAMPLE 3

3300 lbs. of the finished oil of Example 2 were charged in a stainless steel mixing vessel equipped with an agitator and maintained at a temperature of approximately 130° F. 10 lbs. of soya bean lecithin, 15 lbs. of vegetable monoglyceride, artificial coloring and flavoring ingredients, and Vitamin A with beta carotene were then added.

Separately 745 lbs. of sweet skim milk, 80 lbs. of salt, 4 lbs. of a preservative such as sodium benzoate and flavor were pre-mixed and stored at 40° to 50° F. This mixture was added to the oil mixed as hereinbefore set forth and mixed for approximately 10 to 15 minutes until homogeneous. The agitation was continued and the mixture was drawn onto the chill roll, flaked off in thin sheets and then churned through a complector for extrusion as finished margarine. The resultant product proved to have

Table II.—Finished Margarine Oil Compositions

	A	B	C	D	E	F	G	H	I	J	K	L	M
Percent Base Oil A (rearranged)	88												
Percent Base Oil B (rearranged)		96	80	89									
Percent Base Oil C (rearranted)					89								
Percent Base Oil D (rearranged)						90							
Percent Base Oil E (rearranged)							91						
Percent Base Oil F (rearranged)								88	91				
Percent Base Oil G (rearranged)										89			
Percent Base Oil H (rearranged)											93		
Percent Base Oil I (rearranged)												88	
Percent Base Oil J (rearranged)													89
Percent 100° MPw Coconut Oil	8				6	6		6	6	6			8
Percent 100° MPw Palm kernel Oil			20	8			6				4	8	
Percent 100° MPw "Hard Butter"						4		6					3
Percent Tripalmitin	4	4		3	5		3		5		3	4	
Percent Palm Stearine							3						
Percent Cottonseed Flakes													
Melting Pt. Wiley, °F	96.8	93.2	84.2	95.0	97.7	98.0	95.4	100.8	100.4	102.8	101.6	97.2	95.6
Setting Pt., °C	22.6	22.9	22.4	23.2	23.1	25.8	23.4	25.8	24.0	23.5	23.0	23.0	22.5

The amount and degree of hydrogenation of the hydrogenated coconut type oil is dictated by the amounts of other essential ingredients and the further reservation that the melting point range of the finished oil is 84°–102° F. The invention includes 4–20% as the range for the hydrogenated coconut type oil and 3–6% range for the stearine additive. In Table II of the specification, the finished margarine oil designated B contains 4% of the stearine additive and no hydrogenated coconut type oil. This product, although falling within the desired melting point range, was shown to have a vaseline like consistency at room temperature. Also in Table II of the specification, the finished margarine oil, designated as C, contains 20% of the hydrogenated coconut type oil and no stearine additive. The omission of the stearine is possible where the superior characteristics as compared with other types of margarines not made in accordance with the present method.

The following table (Table III) lists a number of other illustrative compositions of finished margarines made by substantially the same procedure as set forth in Example 3. These compositions are made with Finished Oil Compositions except where base oils are set forth. All of the oils of Tables I and II are satisfactory for margin similar to those in Table III.

The foregoing examples are intended to be illustrative and not limitative insofar as the invention is concerned. It is clear that in view of its nature, the invention is to be broadly construed and not to be limited except by the character of the claims appended hereto.

Table III

	A	B	C	D	E	F	G
Pounds of Base Oil H							1,641
Pounds of Base Oil B	1,000						
Pounds of Oil D		1,641				1,641	
Pounds of Oil F				3,300	3,300		
Pounds of Oil H	2,300		3,300				
Pounds of Sweet Skim Milk	745	360		745	370	360	360
Pounds of Cultured Skim Milk			745		370		
Pounds of Cream		20				20	20
Pounds of Salt	73	43	80	80	80		43
Pounds of Lecithin	10	5	10	10	10	5	5
Pounds of Vegetable Monoglyceride	15	7.5	15	15	15	7.5	7.5
Pounds of Preservative	4	2	4	4	4		2
Vitamin A with Carotene, units/lb	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Vitamin D, units/lb	3,200	3,200					3,200
Artificial flavoring to suit taste							

What is claimed is:

1. A margarine oil composition having a major portion and a minor portion, said major portion consisting essentially of a rearranged mixture of about 1 to 10 parts by weight of at least one lauric acid oil and 1 part by weight of at least one non-lauric acid vegetable oil, taken from the class consisting of corn, safflower, sesame, peanut, soya and cottonseend, having a Wiley melting point of 73° to 80° F., said minor portion consisting of about 4 to 20% by weight of said composition of at least one hydrogenated lauric acid oil and from about 3 to 6% by weight of said composition of at least one additive taken from the class consisting of stearines and triglycerides of higher fatty acids having 16 or more carbon atoms and resembling tristearine in solid fat content, said margarine oil composition having a Wiley melting point of about 84° to 102° F.

2. A composition according to claim 1 wherein said hydrogenated lauric acid oil is about 6% to 8% by weight of said margarine oil composition.

3. A composition according to claim 1 wherein said additive is about 3% to 5% of said composition.

4. A composition according to claim 1 wherein said hydrogenated lauric acid oil has a Wiley melting point of about 100° F.

5. A composition according to claim 1 wherein said lauric acid oil is selected from the group consisting of coconut, palm kernel, tucum, babassu and cohume oils.

6. A composition according to claim 1 wherein said rearranged mixture has 65 to 80 parts by weight of said lauric acid oil and 35 to 10 parts by weight of at least one said liquid oil.

7. A method of preparation of a margarine oil having a major and minor portion, comprising rearranging said major portion consisting essentially of a mixture of about 1 to 10 parts by weight of at least one lauric acid oil and 1 part by weight of at least one liquid non-lauric acid vegetable oil, taken from the class consisting of corn, safflower, sesame, peanut, soya and cottonseed, having a Wiley melting point of 73° to 80° F., and thereafter adding to said mixture a minor portion consisting essentially of from 4 to 20% by weight of said composition of at least one hydrogenated lauric acid oil and from about 3 to 6% by weight of said composition of at least one additive taken from the class consisting of stearines and triglycerides of higher fatty acids having 16 or more carbon atoms and resembling tristearine in solid fat content, said margarine oil composition having a Wiley melting point of about 84° to 102° F.

8. A method according to claim 7 wherein said lauric acid oil is selected from the group consisting of coconut, palm kernel, tucum, babassu and cohume oils.

9. A method according to claim 7 wherein said hydrogenated lauric acid oil is about 6% to 8% by weight of said margarine oil composition.

10. A method according to claim 7 wherein said additive is about 3% to 5% of said composition.

11. A method according to claim 7 wherein said hydrogenated lauric acid oil has a Wiley melting point of about 100° F.

12. A method according to claim 7 wherein said rearranged major portion has 65 to 80 parts by weight of said lauric acid oil and 35–20 parts by weight of said non-lauric acid oil.

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