

Palm-based Oil Spray Composition

Field of Invention

The present invention relates to an oil composition which is suitable to be used in the form of a spray (hereinafter referred to as oil spray composition). More particularly, the oil spray composition is a palm-based oil spray composition.

Background of the Invention

Vegetable oil is not suitable to be used directly in the form of a spray because of its high viscosity. To render vegetable oil sprayable, its viscosity must be reduced. This has been done by forming oil in water emulsion from the vegetable oil or by adding alcohol to the vegetable oil and the vegetable oil used is normally selected from those having lower viscosity, for example corn oil, cottonseed oil, grapeseed oil, peanut oil, rapeseed oil, sesame oil, soybean oil and sunflower oil.

Oil spray composition in the form of oil in water emulsion is susceptible to microorganism induced spoilage and has limited shelf life due to its tendency to separate into oil and water phases over time. As alcohol is considered as 'haram' food ingredient or food ingredient which is not 'halal' for the Islamic community, inclusion of alcohol in foodstuff is prohibited or restricted in some countries. More over, oil spray composition containing alcohol exhibits lower flash point and the use of it at high temperature creates a fire hazard.

Generally, vegetable oils having lower viscosity are characterized as having high level of unsaturation. Oil spray compositions formed from these vegetable oils, particularly those having high level of polyunsaturation, tend to be oxidized readily at high temperature and the quality of food prepared by using oxidized oil is not satisfactory. Another drawback associated with the use of these vegetable oils in oil spray compositions is that the resultant oil spray compositions tend to show low smoke point.

Hence, there is a need for an edible oil composition which is suitable to be used in the form of a spray and exhibits low flammability, high oxidative stability, high smoke point and is alcohol-free.

UK patent application no. GB 2 337 528 discloses an alcohol free cooking oil composition, adapted to be dispensed by spraying, comprises a vegetable oil and a medium chain triglyceride (MCT). The minimum amount of MCT used in this composition is 25 vol % and since MCT is a high price material, this composition is very expensive to be produced.

Summary of the Invention

The present invention relates to an oil spray composition comprising 60 – 85 wt % palm product, 12 – 38 wt % propellant and 2 – 10 wt % non-stick material. If the oil spray composition is intended to be used in temperate or cold climate countries, preferably the oil spray composition comprises 60 – 75 wt % palm products, 22 – 38 wt % propellant and 2 – 10 wt % non-stick material.

The palm product is selected from the group comprising palm oil, palm olein, palm stearin, palm kernel oil, palm kernel olein and palm kernel stearin, or mixtures thereof.

The propellant is selected from the group comprising nitrous oxide, carbon dioxide and lower molecular weight hydrocarbons or alkanes including propane, butane and isobutane, or mixtures thereof.

The non-stick material is selected from the group comprising lecithin, monoglycerides and diglycerides, or mixtures thereof. The non-stick material is preferably plant-based, particularly plant-based lecithin and more particularly soy lecithin.

The oil spray composition may further comprise other vegetable oils, preservatives and/or flavouring agents. The vegetable oil may be selected from the group comprising coconut oil, corn oil, cottonseed oil, grapeseed oil, olive oil, peanut oil, rapeseed oil, sesame oil, soybean oil and sunflower oil, or mixtures thereof.

If the oil spray composition is intended to be used for non-food application, the oil spray composition may further comprise any of the following ingredients: oleochemicals, water, fragrance, pigment or dye, insecticide, fungicide, pesticide, herbicide, antibacterial substance or antiviral substance, or mixtures thereof.

The oil spray composition exhibits oxidative stability index of approximately 45 – 50 hours at 100°C and smoke point of approximately 218 – 230°C.

Detailed Description of the Invention

5 Palm products including palm oil, palm olein, palm stearin, palm kernel oil, palm kernel olein and palm kernel stearin are often considered as not suitable to be used in an oil spray composition because of its relatively high viscosity and high level of saturation as compared to other vegetable oils. Palm products also tend to crystallize or solidify at low temperature resulting from their relatively high level of saturation.

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However, palm products have high smoke point and high oxidative stability. Tocopherols are natural antioxidants present in all vegetable oils. Palm products contain tocotrienols in addition to tocopherols and also a small amount of co-enzyme Q10. Gamma- and delta-tocopherols, and their corresponding tocotrienols are very effective in protecting oils from oxidation. Palm products have high oxidative stability due to their high content of gamma- and delta- tocotrienols in addition to their high content of corresponding tocopherols.

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The present invention is about an oil spray composition. The oil spray composition comprises 60 – 85 wt % palm product, 12 – 38 wt % propellant and 2 – 10 wt % non-stick material.

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The palm product is selected from the group comprising palm oil, palm olein, palm stearin, palm kernel oil, palm kernel olein and palm kernel stearin, or mixtures thereof.

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The propellant that is suitable to be used includes nitrous oxide, carbon dioxide and lower molecular weight hydrocarbons / alkanes, such as propane, butane and isobutane, or mixtures thereof.

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The non-stick material that is suitable to be used includes lecithin, monoglycerides and diglycerides. For producing a 'halal' oil spray composition, the non-stick material used must be plant-based. Therefore, the lecithin used is preferably soy lecithin and the use of

monoglycerides and diglycerides is preferably avoided since their 'halal' status is uncertain.

Another vegetable oil, for example coconut oil, corn oil, cottonseed oil, grapeseed oil, olive oil, peanut oil, rapeseed oil, sesame oil, soybean oil and sunflower oil, or mixtures thereof, may be added in the oil spray composition. In this case, the amount of palm product used in the composition would be reduced by the amount of other vegetable oils added. Other ingredients, for example preservatives and flavouring agents, may also be added in the oil spray composition in minor proportions. If the oil spray composition is intended to be used for non-food application, any of the following ingredients may also be added to the oil spray composition: oleochemicals, water, fragrance, pigment / dye, insecticide, fungicide, pesticide, herbicide, antibacterial substance or antiviral substance, or mixtures thereof.

As palm products tend to crystallize or solidify at low temperature, performance of the oil spray composition is affected by changes in temperature. In order to overcome this problem, conditions which allow some of the propellant to dissolve into the palm product or oil are preferred. Such conditions can be created by using a higher amount of propellant in the oil spray composition and/or packing the oil spray composition under a higher pressure.

For producing an oil spray composition suitable to be used in temperate or cold climate countries, preferably the oil spray composition comprises 60 – 75 wt % palm products, 22 – 38 wt % propellant and 2 – 10 wt % non-stick material.

The oil spray composition of the present invention exhibits the following properties:

- moderate viscosity (not more than 75 centipoises at 25°C)
- high oxidative stability (Oxidative Stability Index of approximately 45 – 50 hours at 100°C)
- moderate smoke point (218 – 230°C)
- no trans fatty acids
- no cholesterol
- high level of natural antioxidant

Various embodiments of the oil spray composition are presented below by way of example.

Example 1

- 5 Proportions of the components used in preparing oil spray compositions of the present invention are listed in Table 1. Characteristics of the oil spray compositions at various temperatures are also shown in Table 1.

Composition I consisting 85 wt % palm olein, 12.5 wt % hydrocarbon propellant and 2.5
10 wt % soy lecithin is not suitable to be used at temperatures lower than 10°C.

Composition II consisting 80 wt % palm olein, 17.5 wt % hydrocarbon propellant and 2.5 wt % soy lecithin is not suitable to be used at temperatures lower than 5°C.

- 15 Composition III consisting 77.5 wt % palm olein, 20 wt % hydrocarbon propellant and 2.5 wt % soy lecithin is not suitable to be used at temperatures lower than 5°C.

Composition IV consisting 75 wt % palm olein, 22.5 wt % hydrocarbon propellant and 2.5 wt % soy lecithin is suitable to be used at temperature as low as 0°C.
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Example 2

Nutritional information of oil spray composition IV from Example 1 is provided below:

Nutritional Value per Fingertip Action Spray
(Approximately 0.03 g)

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Energy (kcal)	0.27
Fat	
- Saturated (g)	0.0122
- Monounsaturated (g)	0.0115
- Polyunsaturated (g)	0.003
- Total (g)	0.027

Protein (g)	Negligible
Carbohydrate (g)	Negligible

Table 1

Components	Palm Olein (g)	Hydrocarbon Propellant (g)	Soy Lecithin (g)	Total (g)	Characteristics at Various Temperatures															
					25°C		20°C		15°C		10°C		5°C		0°C					
					Solid(S) / Liquid(L) Phase	Mist Quality	Solid(S) / Liquid(L) Phase	Mist Quality	Solid(S) / Liquid(L) Phase	Mist Quality	Solid(S) / Liquid(L) Phase	Mist Quality	Solid(S) / Liquid(L) Phase	Mist Quality	Solid(S) / Liquid(L) Phase	Mist Quality				
Composition I	340	50	10	400	L	Excellent	L	L	Good	L	L	Good	L	L	Good	S	S	No Mist	S	No Mist
Composition II	320	70	10	400	L	Excellent	L	L	Excellent	L	L	Good	L	L	Good	L	L	Good	S	No Mist
Composition III	310	80	10	400	L	Excellent	L	L	Excellent	L	L	Good	L	L	Good	L	L	Good	Semi	Low
Composition IV	300	90	10	400	L	Excellent	L	L	Excellent	L	L	Good	L	L	Good	L	L	Good	L	Good

Claims

- 1) An oil spray composition comprising 60 – 85 wt % palm product, 12 – 38 wt % propellant and 2 – 10 wt % non-stick material.
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- 2) An oil spray composition comprising 60 – 75 wt % palm product, 22 – 38 wt % propellant and 2 – 10 wt % non-stick material.
- 3) An oil spray composition as claimed in claim 1 or 2 wherein the palm product is selected from the group comprising palm oil, palm olein, palm stearin, palm kernel oil, palm kernel olein and palm kernel stearin, or mixtures thereof.
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- 4) An oil spray composition as claimed in claim 1 or 2 wherein the propellant is selected from the group comprising nitrous oxide, carbon dioxide and lower molecular weight hydrocarbons or alkanes including propane, butane and isobutane, or mixtures thereof.
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- 5) An oil spray composition as claimed in claim 1 or 2 wherein the non-stick material is selected from the group comprising lecithin, monoglycerides and diglycerides, or mixtures thereof.
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- 6) An oil spray composition as claimed in claim 5 wherein the non-stick material is plant-based.
- 7) An oil spray composition as claimed in claim 6 wherein the non-stick material is plant-based lecithin.
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- 8) An oil spray composition as claimed in claim 7 wherein the plant-based lecithin is soy lecithin.
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- 9) An oil spray composition as claimed in claim 1 or 2 further comprising another vegetable oil.

10) An oil spray composition as claimed in claim 9 wherein the vegetable oil is selected from the group comprising coconut oil, corn oil, cottonseed oil, grapeseed oil, olive oil, peanut oil, rapeseed oil, sesame oil, soybean oil and sunflower oil, or mixtures thereof.

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11) An oil spray composition as claimed in claim 1 or 2 further comprising any of the following ingredients: preservatives, flavouring agents, oleochemicals, water, fragrance, pigment or dye, insecticide, fungicide, pesticide, herbicide, antibacterial substance or antiviral substance, or mixtures thereof.

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12) An oil spray composition as claimed in claims 1 to 11 with oxidative stability index of 45 – 50 hours at 100°C.

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13) An oil spray composition as claimed in claims 1 to 11 with smoke point of 218 – 230°C.

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