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PROCESS FOR PREPARING AN ESSENTIAL OIL COMPOSITION
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ABSTRACT OF THE DISCLOSURE
Preparation of an essential oil composition by mixing said oil with a polyoxyxalkylene hexitol anhydride partial long chain fatty acid ester and combining therewith a synthetic inorganic powder selected from hydrous calcium silicate and hydrous silica.

This invention relates to an essential oil-containing composition and a process for the uniform distribution of an essential oil in a powdered food-type carrier. More particularly, it relates to a substantially non-volatile, water-miscible, essential oil-containing composition especially suitable for deposition into a powdered food-type carrier and its preparation.

Certain extracts of plant origin are highly desirable as food additives and are conventionally prepared as either a dried powder, for example, garlic powder, or distilled into what is known as an essential oil. The essential oil is employed either in its concentrated form or, more desirably, by deposition on a powdered food-grade carrier. This deposition and/or coating of essential oils such as garlic, onion and mustard on the surface of a powdered food material such as salt, glucose and starch has long been practiced.

Hitherto, conventional deposition processes have produced a number of undesirable features, including (1) excessive evaporation and oxidation of the essential oil when it is extended by blending on the individual particles of the powdered carrier; (2) a subsequent reduction in the flakiness of the powdered carrier containing the essential oil; and (3) an undesirable coalescence of the essential oil phase when the powder-oil mixture is subsequently employed in an aqueous vehicle.

It has now been found that the physical properties of essential oils can be modulated to be substantially non-volatile, of suitable water miscibility and generally compatible with conventional powdered food carriers. This is accomplished by combining the essential oil with a high molecular weight food-grade emulsifying agent which is a liquid or semi-solid at room temperature. It has been found that by the addition of the high molecular weight emulsifier, the volatility of the essential oil is decreased while the water miscibility of the essential oil is increased. However, the resulting mixture is even more difficult to uniformly disperse in a food-type carrier than the essential oil alone. It was subsequently found that the addition of a finely divided silica, either before, during or after dispersion of the emulsifying-agent-essential oil on the carrier produces a free-flowing composition without the other adverse properties heretofore attendant when essential oils are dispersed on conventional food powder carriers.

Although it is not intended for the invention to be limited to any specific theoretical concept, it now appears that the high molecular weight emulsifying agent prevents the rapid evaporation of the essential oils as well as producing water miscibility, while the finely divided inorganic powder because of its large surface area and high adsorbing capacity, adsorbs the mixture even when it has been distributed on the carrier. As a result of the introduction of such emulsifying agents and adsorbents, the desirable properties of the essential oil are not affected, yet the detrimental features attendant with the prior art are eliminated.

The term "high molecular weight emulsifying agent" is meant to include those food-grade, non-ionic, surface-active agents having a molecular weight in excess of about 500 and which occur as a liquid or semi-solid and possess emulsifying properties. It is most important that the emulsifying agent hinder the evaporation of the essential oil, e.g., increase the surface tension, as well as aid in the dispersion of the oil in an aqueous phase. Emulsifying agents which are preferred include, for example, those edible polyoxyxalkylene derivatives of hexitol anhydride partial long chain fatty acid esters which are miscible in an aqueous medium as well as with the particular essential oil. An advantageous emulsifying agent for the purposes of this invention has been found to be polyoxyxalkylene sorbitan monoolesate, commercially available as Tween 80 (a registered trademark of the Atlas Powder Company), although other emulsifying agents such as polyoxyxalkylene sorbitan monostearate can be employed.

The highly adsorbent synthetic inorganic powders which are suitable for this invention include those edible synthetic powders which have a large surface area, high adsorption capacity, finely divided particle size and function as anti-caking agents. This includes especially those finely divided silica compounds such as synthetic hydrous calcium silicate and synthetic hydrous silica.

Although any of the well-known food-grade carrier powders in their commonly available anhydrous form are suitable for the purposes of this invention, particularly desirable carriers include conventionally prepared salt, dextrose, glucose, starch and the like.

The high molecular weight emulsifying agent should be employed in an amount sufficient to prevent substantial evaporation of the essential oil and induce water-miscibility. It has been found to be advantageous to employ the essential oil and high molecular weight emulsifying agent in a ratio by weight of from 1:1 to 1:20 depending upon the particular emulsifier and essential oil being mixed. In the case of garlic oil, the preferred ratio has been found to be between 1:6 and 1:9.

Again, the edible inorganic powder should be employed in an amount sufficient to substantially prevent caking of the essential oil and emulsifying agent with the carrier material. More particularly, the ratio of inorganic powder to the combined weight of emulsifier-essential oil employed is advantageously maintained in the range of from 1:5 and 2:1, respectively, by weight. The preferred ratio has been found to be about 1:1 by weight.

Although the amount of powdered food-type carrier which is combined will depend upon the intensity of the essential oil flavor desired, satisfactory results are obtained when the essential oil composition is extended with from 90-99%, of the total combined weight, of powdered food-type carrier. Preferably, about 96-98% of the food-type carrier and conversely, 2-4% by weight of the emulsifier-oil-inorganic powder combination should be employed.

In order to insure that the emulsifier will produce the desired modification in the physical properties of the essential oil, it is necessary to thoroughly mix the emulsifying agent and oil before combining either the finely divided inorganic powder or food-type carrier therewith. However, once the emulsifier-essential oil blend has been obtained, the other components may be added separately or both may be blended in simultaneously. However, it is preferred to first introduce the inorganic powder and then add the resulting 3-component mixture to the food-type carrier.
The process of combining the aforementioned ingredients is preferably accomplished at room temperature although higher or lower temperatures may be desirable depending on the physical properties of the particular components being processed.

To further illustrate the invention, the following example is provided. It should be understood that the details thereof are not to be regarded as limitations as they may be varied as will be understood by one skilled in this art. The percentages included throughout this disclosure are based on the total weight of the final product, unless otherwise indicated.

A garlic oil-dextrose composition having the approximate flavor strength of dried garlic powder was prepared in the proportions as set forth below:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Garlic oil</td>
<td>0.125</td>
</tr>
<tr>
<td>Polyoxyethylene sorbitan monooleate</td>
<td>1.125</td>
</tr>
<tr>
<td>Hydrous calcium silicate (Micro-Cel)</td>
<td>1.250</td>
</tr>
<tr>
<td>Anhydrous dextrose powder</td>
<td>97.500</td>
</tr>
<tr>
<td></td>
<td>100.000</td>
</tr>
</tbody>
</table>

1 A registered trademark of the Johns Manville Co.

The garlic oil and polyoxyethylene sorbitan monooleate were first thoroughly mixed at 30°C. Then the calcium silicate was introduced to the mixture and thoroughly combined therewith. The resulting combination was added to the dextrose powder and completely blended therewith. Thereafter, the product was commercially packaged and stored for a lengthy period without noticeable lumping or reduction in flowability or loss in essential oil intensity. The blended product was thereafter incorporated in a sausage composition in an amount up to about 0.05% by total weight of sausage.

Although the foregoing invention has been described in some detail by way of illustration and example for purposes of clarity of understanding, it will be understood that certain changes and modifications may be practiced within the scope of the invention as limited only by the appended claims.

What is claimed is:

1. A process for preparing a substantially non-volatile, water-miscible essential oil especially suitable for distribution in a powdered food-type carrier, comprising mixing the essential oil with a liquid or semi-solid polyoxyalkylene hexitol anhydride partial long chain fatty acid ester, in an amount sufficient to prevent substantial evaporation of said oil when added to said carrier and produce substantial water-miscibility when the essential oil-containing carrier is introduced into an aqueous medium; and combining the mixture of essential oil and emulsifying agent with a highly absorbent food-grade synthetic inorganic powder selected from the group consisting of hydrous calcium silicate and hydrous silica, in an amount sufficient to prevent caking of the oil-emulsifying agent mixture when added to said carrier and whereby the resulting combination of essential oil, emulsifying agent and synthetic inorganic powder can thereafter be blended with said powdered food-type carrier.

2. A process in accordance with claim 1 wherein the weight ratio of oil to emulsifying agent is from about 1:1 to 1:20.

3. A process in accordance with claim 1 wherein the essential oil is garlic oil and the powdered food-type carrier is anhydrous dextrose powder.

4. A process of preparing an anhydrous dextrose powder containing a substantially non-volatile, water-miscible garlic oil, comprising: mixing said garlic oil with a polyoxyethylene sorbitan monooleate in the weight ratio of from about 1:6 to 1:9; combining the mixture of garlic oil and monooleate with synthetic hydrous calcium silicate, the ratio of said mixture to calcium silicate being about 1:1 by weight; and thereafter blending from about 2–4% by weight of the combination with from about 96–98% by weight of anhydrous dextrose powder, whereby when said blend is added to an aqueous phase said garlic oil will be uniformly dispersed therein.

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