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FLAVOR MODIFYING COMPOSITION

The present invention relates to flavoring compositions. More particularly, it relates to a flavor modifying composition comprising combinations of neohesperidine dihydrochalcone with maltol or ethyl maltol.

Processed foodstuffs and flavors added to processed foodstuffs typically do not have the intense flavor associated with consumer preferences. For this reason, a flavor enhancing agent may be added to potentiate the flavor. In addition to potentiation of the flavor, the flavor enhancing agent also potentiates the body and mouthfeel of the flavor or foodstuff.

Two of the most widely used flavor enhancers are maltol and ethylmaltol. Maltol is a naturally occurring substance found in the bark of young larch trees, pine needles and chicory. Early commercial production of maltol was from the destructive distillation of wood. Natural maltol is usually obtained only in very small quantities by the above method.

The synthesis of synthetic maltols as well as other gamma-pyrones, such as pyromeconic acid, is described in United States patent numbers 3,130,204, 3,133,089, 3,140,239, 3,159,652, 3,365,469, 3,376,317, 3,468,915, 3,440,183, and 3,446,629.

The synthesis of maltol and ethyl, maltol, along with other gamma pyrones, using a furfuryl alcohol as a starting material is described in United States Patent numbers 4,082,717 and 4,289,704.

Neohesperidine dihydrochalcone is a sweetening agent prepared from naringen, a flavanone glycoside occurring naturally in grapefruit, by the process described in United States patent numbers 3,087,821 and 3,375,242.

United States Patent number 4,087,588 refers to the use of neohesperidine dihydrochalcone as a sweetening agent.

European Patent Application number 500977 refers to the use of neohesperidine dihydrochalcone to potentiate the body and mouthfeel of foods and beverages.

United States Patent number 3,653,923 refers to a combination of neohesperidine dihydrochalcone and a sacharrinous sweetener as a sweetening agent.

European patent application number 507598 refers to a combination of sucralose and neohesperidine dihydrochalcone as a sweetening agent.

United States Patent Number 4,581,378 refers to neohesperidine dihydrochalcone as a sweetening agent in a rodenticide composition.

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In one embodiment, the present invention is directed to a flavor-modifying composition comprising maltol and neohesperidine dihydrochalcone.

Preferred is the composition wherein maltol is present at a level of from about 5 to about 100 parts per million and neohesperidine dihydrochalcone is present at a level of from about 0.1 to about 10.0 parts per million.

The present invention is also directed to a foodstuff comprising the maltol-neohespiridine dihydrochalcone composition.

The present invention is also directed to a method of modifying the flavor, body and mouthfeel of a foodstuff by adding to the foodstuff the maltol-neohesperidine dihydrochalcone composition.

Preferred is the method wherein said foodstuff is selected from the group consisting of soft carbonated beverages, soft non-carbonated fruit flavored beverages, soft non-carbonated beverages, sauces, toppings, meat products, poultry products, animal feeds, confectionery products, baked goods, alcoholic beverages, savory snacks, dairy products, condiments, and gravies.

In another embodiment, the present invention is directed to a flavor-modifying composition comprising ethylmaltol and neohesperidine dihydrochalcone.

Preferred is the composition wherein ethylmaltol is present at a level of from about 0.1 to about 20 parts per million and neohesperidine dihydrochalcone is present at a level of from about 0.1 to about 10.0 parts per million.

The present invention is also directed to a foodstuff comprising the ethylmaltol-neohesperidine dihydrochalcone composition.

The present invention is also directed to a method of modifying the flavor, body and mouthfeel of a foodstuff comprising adding to the foodstuff the ethylmaltol-neohesperidine dihydrochalcone composition.

Preferred is the method wherein said foodstuff is selected from the group consisting of soft carbonated beverages, soft non-carbonated fruit flavored beverages, soft non-carbonated beverages, sauces, toppings, meat products, poultry products, animal feeds, confectionery products, baked goods, alcoholic beverages, savory snacks, dairy products, condiment and gravies.

In still another embodiment, the present invention is directed to a flavor modifying composition comprising maltol, ethylmaltol and neohesperidine dihydrochalcone.

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Preferred is the composition wherein maltol is present at a level of from about 5 to about 100 parts per million, ethylmaltol is present at a level of from about 0.1 to about 20 parts per million and neohesperidine dihydrochalcone is present at a level of from about 0.1 to about 10.0 parts per million.

The present invention is also directed to a foodstuff comprising the maltol ethylmaltol, neohesperidine dihydrochalcone composition.

The present invention is also directed to a method of modifying the flavor, body and mouthfeel of a foodstuff comprising adding to the foodstuff the maltol-ethylmaltol-neohesperidine dihydrochalcone composition.

Preferred is the method wherein said foodstuff is selected from the group consisting of soft carbonated beverages, soft non-carbonated fruit flavored beverages, soft non-carbonated beverages, sauces, toppings, meat products, poultry products, animal feeds, confectionery products, baked goods, alcoholic beverages, savory snacks, dairy products, condiments and gravies.

The present invention is also directed to a method of reducing the unpleasant taste of a pharmaceutical composition comprising adding to the pharmaceutical a flavor potentiating composition, said flavor potentiating composition selected from the group consisting of

(a) maltol-neohesperidine dihydrochalcone;

(b) ethylmaltol - neohesperidine dihydrochalcone; and

(c) maltol - ethylmaltol-neohesperidine dihydrochalcone.

One component of certain flavor-modifying compositions of the present invention is maltol. Natural or synthetic maltol may be used and in the context of the present specification, the term maltol encompasses both types. Synthetic maltol is commercially available from the Food Science Group of Pfizer Inc and is sold under the trade name Veltol®.

Another component of certain flavor-modifying compositions of the present invention is ethyl maltol. Ethyl maltol is also commercially available from the Food Science Group of Pfizer Inc and is sold under the trade name Veltol® Plus.

Another component of the flavor-potentiating composition of the present invention is neohesperidine dihydrochalcone which is commercial available from Linke and Exquim

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If the flavor-modifying composition contains maltol, the maltol is present at a level of from about 5 to about 100 parts per million.

If the flavor-modifying composition contains ethylmaltol, the ethylmaltol is present at a level of from about 0.1 to about 20 parts per million.

The level of neohesperidine in the flavor modifying composition will be from about 0.1 to about 10.0 parts per million.

Non-limiting examples of foodstuffs into which the flavor-modifying compositions may be added include soft carbonated beverages, soft non-carbonated fruit flavored beverages, soft non-carbonated beverages, sauces, toppings, meat products, poultry products, animal feeds, confectionery products, baked goods, alcoholic beverages, savory snacks, dairy products, condiments and gravies.

The flavor-modifying compositions of the present invention may also be added to pharmaceutical compositions, both ethical and over the counter (OTC).

The flavor-modifying compositions of the present invention may also be added to animal feeds.

Having described the invention in general terms, reference is now made to specific examples. It is to be understood that these examples are not meant to limit the present invention, the scope of which is determined by the appended claims.

EXAMPLE 1

Diet Cola

Samples of a commercial aspartame-sweetened diet cola, alone and supplemented with flavor enhancers, were evaluated by an expert panel of sensory assessors as noted below:

a. The control without added flavor enhancers was found to have a good quality sweetness, a flavor typical of cola, and a somewhat bitter aftertaste.

b. A sample containing 3 ppm of Veltol Plus was sweeter and more rounded in flavor than the control.

c. A sample containing 1 ppm of Veltol Plus and 1 ppm of neohesperidine dihydrochalcone (NHDC) had upfront sweetness which was longer lasting, a greater flavor impact, and less bitterness than the control.

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EXAMPLE 2

Tangerine Flavor

Aqueous solutions containing 0.1% tangerine flavor, 5% sucrose, and 0.15% citric acid, alone and supplemented with flavor enhancers, were evaluated by expert sensory panelists as noted below:

a. The control without flavor enhancers was aldehydic, tart, and typical of tangerine.

b. A sample containing 5 ppm of Veltol was slightly less acidic.

c. A sample containing 2 ppm of Veltol Plus was sweet, less acidic, and juicier than the control.

d. A sample containing 2 ppm NHDC, 3 ppm of Veltol, and 1 ppm of Veltol Plus had a flavor profile which was fuller, juicier, and more intense than that of the control.

EXAMPLE 3

Original Fat Free Style Barbecue Sauce

A standard original fat free style barbecue sauce was evaluated.

The barbecue sauce was then dosed with various levels of Veltol, Veltol-Plus, and NHDC combinations with both Veltol and Veltol-Plus. These were then compared to the standard barbecue sauce:

a. Standard barbecue sauce was acidic, spicy, and thin.

b. Veltol at a level of 50ppm increased the spice notes.

c. Veltol-Plus at a level of 10pm increased sweetness, and reduced the acid bite.

d. NHDC at 2ppm along with 30ppm Veltol and 5ppm Veltol-Plus made the body creamier, rounded the flavor, increased spice notes, and reduced acid bite.

EXAMPLE 4

Dark (Bittersweet) Chocolate

A standard dark (bittersweet) chocolate product was evaluated with Veltol, and NHDC and Veltol combinations. The products made contained 100ppm of Veltol, 1ppm NHDC along with 100ppm of Veltol.

a. Standard dark (bittersweet) chocolate was typical.

b. Veltol at 100ppm increased creaminess, sweetness, and chocolate character.

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c. NHDC at 1ppm along with 100ppm of Veltol also increased body, mouthfeel, and increased the chocolate character. There was no significant difference between the enhancement that Veltol at 100ppm had on the standard.

Table 1 illustrates various combinations of Neohesperidine Dihydrochalcone (NHDC) with Veltol®(V) and/or Veltol®-Plus (V-P) and the effect of these combinations on various flavors:

Table 1

NEOHESPERIDINE DIHYDROCHALCONE (NHDC) SYNERGIES WITH VELTOL® AND VELTOL®-PLUS (V-P)					
FLAVOR	LEVEL	NHDC (ppm alone)	VELTOL® (ppm alone)	VELTOL®-PLUS (ppm alone)	COMMENTS
Apple Flavor WONF Dragoco #9/7OF152	0.30%	3	50	5	NHDC: more skin notes. V:fuller, sweeter, fattier. V-P: more green notes.
Berry Flavor WONF Dragoco #9/7OE786	0.15%	3	60	30	NHDC: woodier. V: sweeter, intensified character. V-P: fuller, increased berry notes
Chocolate WONF Universal#837882	0.30%	3	40	4	NHDC: sweeter, more intense. V: fuller, more cocoa-like, V-P fuller
N/A Chocolate Flv Tastemaker#274955	0.10%	2	3	3	NHDC: sweeter. V: fuller, sweeter. V-P: more chocolate character.
Grape Flavor WONF Dragoco#97OE352	0.30%	1	0	5	NHDC: sweeter concord notes. V-P: enhanced musty, fruity, concord
Nat Lime Flavor F&F Ingred#94035	0.10%	2	30	3	NHDC: sweeter, less dirty notes. V: fuller, less terpene notes. V-P: less terpene notes, sweeter.
Nat Tangerine Flv F&F Ingred#94034	0.10%	3	5	2	NHDC: sweeter, slightly more aldehydic. V: slightly less acidic. V-P: sweeter, less acidic, juicier.

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N/A Vanilla Flavor D.Michael#11967	.30%	2	4	2	NHDC: sweeter, slightly more vanillin impact. V: fuller, rounded flavor char. V-P: rounded more impact.	
Nat flavor for Beef D. Michael#13460	.60%	1	50	20	NHDC: sweeter onion character. V: sweet, intensifies beef char. V-P: Intensifies beef character.	
Sour Cream WONF D.Michael#7192	.20%	2	20	6	NHDC: sweet, incr. cream & acid notes. V: increases butter notes, V-P: sweeter, more butter, cream notes.	
		NEOHESPERIDINE DC SYNERGIES WITH VELTOL® AND VELTOL®-PLUS				
FLAVOR	LEVEL	NHDC (ppm alone)	VELTOL® (ppm alone)	VELTOL®-PLUS (ppm alone)	SYNERGISTIC LEVELS (PPM)	COMMENTS
Apple Flavor WONF Dragoco #9/7OF152	0.30%	3	50	5	2(NHDC),20(V),2(V-P)	more impact, enhanced green notes.
Berry Flavor WONF Dragoco #9/7OE786	0.15%	3	60	30	3(NHDC),30(V),10(V-P)	fuller, sweeter more impact on berry character.
Chocolate WONF Universal#837882	0.30%	3	40	4	2(NHDC),10(V),2(V-P)	good impact on flavor intensity.
N/A Chocolate Flv Tastemaker#274955	0.10%	2	3	3	2(NHDC),2(V),1(V-P)	slightly sweeter, more chocolate notes
Grape Flavor WONF Dragoco#97OE352	0.30%	1	0	5	0.8(NHDC)2,(V-P)	more impact on musty acid notes.

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Nat Lime Flavor F&F Ingred#94035	0.10%	2	30	3	2(NHDC),10(V),1(V-P)	reduced the terpene notes, sweeter.
Nat Tangerine Flv F&F Ingred#94034	0.10%	3	5	2	2(NHDC),3(V),1(V-P)	made it fuller and juicer.
N/A Vanilla Flavor D.Michael#11967	0.30%	2	4	2	2(NHDC),2(V),1(V-P)	increased vanilla character.
Nat flavor for Beef D. Michael#13460	0.60%	1	50	20	1(NHDC),20(V),10(V-P)	less onion, made beef
Sour Cream WONF D.Michael #7192	0.20%	2	20	6	1(NHDC),8(V),2(V-P)	heavier, richer increased dairy cream and acid notes.

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Table 2

Table 2 illustrates various NHDC, Veltol® or Veltol® Plus combinations in beverages and other foods

NEOHESPERIDINE DC SYNERGIES WITH VELTOL® AND VELTOL®-PLUS				
PRODUCT	NHDC (ppm alone)	VELTOL® (ppm alone)	VELTOL®-PLUS (ppm alone)	COMMENTS
"clearly canadian" carbonated peach	2	0	3	NHDC: Sweeter, fuller VELTOL-PLUS: sweet, fruitier.
"clearly canadian" carbonated wild cherry	3	0	3	NHDC: rounded, fuller, sweeter. VELTOL-PLUS: sweeter, more flavor impact.
"ocean spray" oran-cherry	2	30	4	NHDC: sweeter, darker black cherry, less astringent. VELTOL: rounded, VELTOL-PLUS sweeter, fruitier.
"gatorade" lemon-lime	2	0	3	NHDC: juicier. VELTOL-PLUS: sweeter.
"folgers" coffee,caffeinated	2	50	0	NHDC: slightly sweeter, slightly bitter aftertaste. VELTOL: less bitter.
"kraft healthy favorite" original BBQ sauce	3	50	10	NHDC: slightly sweet aftertaste, more spice notes. V: more spice notes, V/P: sweeter, less acid bite.
"kraft healthy favorite" hickory smoke BBQ sauce	3	50	0	NHDC: more spice notes, rounded. VELTOL: sweeter, less acid bite.

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"kraft" fat free ranch dressing	3	75	10	NHDC: sweet, rounded flavor. VELTOL: creamy. less acid bite. V/P; creamy, more dairy notes.
"kraft" nonfat honey dijon dressing	3	50	10	NHDC: sweeter, rounder, VELTOL; creamy, fuller V/P: sweet, rounded flavor.
"kraft" fat free 1000 island dressing	3	50	0	NHDC: sweeter, fuller VELTOL; sweeter, more tomato character.

NEOHESPERIDINE DC SYNERGIES WITH VELTOL® AND VELTOL®-PLUS

PRODUCT	NHDC (ppm alone)	VELTOL® (ppm alone)	VELTOL®-PLUS (ppm alone)	SYNERGISTIC LEVELS	COMMENTS
"clearly canadian" peach	2	0	3	NHDC(2), V/P(1)	fuller, with a higher flavor impact.
"clearly canadian" wild cherry	3	0	3	NHDC(2), V/P(1)	rounder with a higher flavor impact.
"ocean spray" oran-cherry	2	30	4	NHDC(1),V(10),V/P(2)	fuller, rounded dark cherry character.
"gatorade" lemon-line	2	0	3	NHDC(),V/P(1)	fuller, rounded, and juicier.
"folgers" coffee,caffeinated	2	50	0	NHDC(1),V(30)	more flavor impact, rounder, less bitter.

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"kraft healthy favorite" original BBQ sauce	3	50	10	NHDC(2,V(30),V/P(6)	creamy, rounded, less acid, more spice.
"kraft healthy favorite" hickory smoke BBQ sauce	3	50	0	NHDC(2),V(20),V/P(3)	fuller more spice and smoke notes.
"kraft" fat free ranch dressing	3	75	10	NHDC(2),V(10),V/P(1)	fuller, more flavor impact.
"kraft" nonfat honey dijon dressing	3	50	10	NHDC(1),V(10),V/P(2)	sweeter, rounded flavor.
"kraft" fat free 1000 island dressing	3	50	0	NHDC(1),V(10)	tomatosy, creamy, fuller.

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Table 3 Illustrates Various NHDC, Veltol® or Veltol® Plus Combinations in Iced Teas

Table 3

NEOHESPERIDINE DC SYNERGIES WITH VELTOL® AND VELTOL®-PLUS				
PRODUCT	NHDC (ppm alone)	VELTOL® (ppm alone)	VELTOL®-PLUS (ppm alone)	COMMENTS
Lipton Iced Tea Mix "sugar free lemon w/nutrasweet	3	50	5	NHDC: sweeter, more candy lemon, less dirty. V: rounder, slightly sweeter, V/P more flavor impact
"Lipton Iced Tea Mix "decaf sugarfree lemon w/nutrasweet	3	50	5	NHDC: candy lemon, less tart. VELTOL: rounder. VELTOL-PLUS: sweeter, more flavor impact.
"Lipton Iced Tea Mix "sugar free peach w/nutrasweet	0	0	0	NHDC: two much peach lactone. Tried 1, 2, 3 ppm. Flavor profile unacceptable for application.
"Lipton Iced Tea Mix "sugar free raspberry w/nutrasweet	3	20	3	NHDC: made it greener (apple-like). VELTOL: fuller, rounder, berry-like, V/P: berry like, sweeter
"Lipton Iced Tea Mix" sugar free tropical w/nutrasweet	3	20	0	NHDC: Increased sulfury tropical notes. VELTOL: more flavor impact.

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CLAIMS

1. A flavor-modifying composition comprising maltol and neohesperidine dihydrochalcone.

2. A composition according to claim 1 wherein maltol is present at a level of from about 5 to about 100 parts per million and neohesperidine dihydrochalcone is present at a level of from about 0.1 to about 10.0 parts per million.

3. A foodstuff comprising the composition of claim 1.

4. A method of modifying the flavor, body and mouthfeel of a foodstuff comprising adding to the foodstuff the composition of claim 1.

5. The method of claim 4 wherein said foodstuff is selected from the group consisting of soft carbonated beverages, soft non-carbonated fruit flavored beverages, soft non-carbonated beverages, sauces, toppings, meat products, poultry products, animal feeds, confectionery products, baked goods, alcoholic beverages, savory snacks, dairy products, condiments, and gravies.

6. A flavor-modifying composition comprising ethylmaltol and neohesperidine dihydrochalcone.

7. A composition according to claim 6 wherein ethylmaltol is present at a level of from about 0.1 to about 20 parts per million and neohesperidine dihydrochalcone is present at a level of from about 0.1 to about 10.0 parts per million.

8. A foodstuff comprising the composition of claim 6.

9. A method of modifying the flavor, body and mouthfeel of a foodstuff comprising adding to the foodstuff the composition of claim 6.

10. The method of claim 9 wherein said foodstuff is selected from the group consisting of soft carbonated beverages, soft non-carbonated fruit flavored beverages, soft non-carbonated beverages, sauces, toppings, meat products, poultry products, animal feeds, confectionery products, baked goods, alcoholic beverages, savory snacks, dairy products, condiments, and gravies.

11. A flavor-modifying composition comprising maltol, ethylmaltol and neohesperidine dihydrochalcone.

12. A composition according to claim 11 wherein maltol is present at a level of from about 5 to about 100 parts per million, ethylmaltol is present at a level of from about 0.1 to about 20 parts per million and neohesperidine dihydrochalcone is present at a level of from about 0.1 to about 10.0 parts per million.

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13. A foodstuff comprising the composition of claim 11.

14. A method of modifying the flavor, body and mouthfeel of a foodstuff comprising adding to the foodstuff the composition of claim 11.

15. The method of claim 14 wherein said foodstuff is selected from the group consisting of soft carbonated beverages, soft non-carbonated fruit flavored beverages, soft non-carbonated beverages, sauces, toppings, meat products, poultry products, animal feeds, confectionery products, baked goods, alcoholic beverages, savory snacks, dairy products, condiments and gravies.

16. A method of reducing the unpleasant aftertaste of a pharmaceutical composition comprising adding to the pharmaceutical composition a flavor-modifying composition, said flavor modifying composition selected from the group consisting of:

(a) maltol-neohesperidine dihydrochalcone;

(b) ethylmaltol - neohesperidine dihydrochalcone;

(c) maltol - ethylmaltol - neohesperidine dihydrochalcone.

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