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SUGAR COMPOSITIONS

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This invention relates to the production of novel sugar compositions which are made from combinations of sugars containing original and refined non-sugar impurities to produce maple flavored sugar and table syrup as well as jellies having new and novel flavor characteristics, the table syrup and the jelly being produced from a common source and particularly from a readily water dispersible edible sugar containing brick or bar.

By the term "original non-sugar impurities" is meant those non-sugar impurities which resemble qualitatively and in their proportidns of one to the other the non-sugar impurities of the original cane juice or the juice of the sugar cane as originally expressed.

The sugar compositions containing the original non-sugar impurities have desirably been subjected to a lime treatment after the cane juice has been expressed from the sugar cane. For example, cane juice as expressed from the sugar cane may be subjected to treatment with lime and the cane juice thereafter filtered. The cane juice thus obtained will carry these original non-sugar impurities in the proportions desired for use in accordance with the procedures of the present invention.

Furthermore, the products made from the cane juice such as raw sugar crystallized therefrom or the washings removed from the outer surfaces of the raw sugar crystals which have not been subjected to further treatment to change the original non-sugar impurities may similarly be used in accordance with the procedures of the present invention.

These original non-sugar impurities include the non-sugar impurities present in cane juice which has preferably been lime treated as well as in the outer surfaces of the individual crystals of raw sugar which may be removed by washing the outer surfaces of the raw sugar crystals with centrifugalization.

For example, as included in the sugar compositions which contain original non-sugar impurities there are included cane juice which desirably has been limed and raw sugar and special intermediate products made from the limed cane juice such as indicated below. For example, such type of syrup containing said original raw sugar impurities may be prepared by first producing raw sugar from limed cane juice which involves crystallization of raw sugar crystals from the limed cane juice. The raw sugar crystals are then placed into a centrifuge and washed with water to remove and concentrate the syrup film contained on the outer surfaces of the raw sugar crystals. As the raw sugar crystals are washed in the centrifuge the outer surfaces of the raw sugar crystals are removed in the centrifuge and this outer film may then be press filtered (without the use of charcoal or bone black) and may be concentrated either before or after filtration. This product contains the original non-sugar impurities of the limed cane juice and will have a purity of from 70 to 89 and is composed substantially of the original film surrounding the raw sugar crystals.

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By "refined non-sugar impurities" is meant those non-sugar impurities which are contained in the refined sugar residues such as in that type of cane syrup and particularly molasses which has been refined through bone black, charcoal, carbonates and phosphates and which include non-sugar impurities that are not entirely common to the non-sugar impurities of cane juice but which non-sugar impurities become a part of the total non-sugar impurities during the refining process.

Cane juice which has been treated with lime as well as impurities of the water extract of the sugar cane and also raw sugars made therefrom are objectionable tasting substances.

It has now been found that by preparing special combinations of cane sugar materials containing certain proportions of original non-sugar impurities and refined non-sugar impurities at certain ash levels and having certain ash compositions, and desirably at certain pH ranges that a chemical change takes place in the objectionable tasting substances, particularly with application of heat whereby they are so modified as to enable formation of a composition having a highly desirable palatable flavor which composition may be utilized as a maple flavored table syrup or used in the manufacture of jellies, gums and other food compositions.

By this treatment, the objectionable tasting non-sugar impurities are desirably reacted and modified to form highly desirable, stable, homogeneous, non-oxidizable flavor complexes.

An object of the present invention is to provide a stable, non-fermentable, non-perishable, non-volatile and non-oxidizable solid sugar composition in water dispersible edible brick, bar or other solid form in which the objectionable flavors of the impurities of the sugar cane have been reacted to produce a highly desirable food composition having a maple like flavor.

A further object is to produce a solid mass which may be readily solubilized or dispersed for

use with other food compositions. The solubilization and ready dispersion of the solid mass is a particularly important characteristic of the product produced by the present invention.

A further object is to produce a water dispersible, edible, sugar containing composition which may also be utilized as a base for candy and confection manufacture, ice cream, ices and sherbets, puddings, beverages and other food compositions in which the sweetening value has been enhanced far beyond the amount of sucrose present and which contains novel and highly desirable flavor complexes.

A still further object is to raise the economic value of relatively impure sugar cane materials which may be normally discarded as waste and by the process of the present invention to convert these materials into a highly desirable, readily utilizable, water dispersible, edible, sugar containing food composition having great value.

A further object is to provide a sugar composition in water dispersible, edible, sugar containing solid brick or bar form which may be utilized either as a ration bar or upon reconstitution with water for the dual purpose of a table syrup or a basic composition for the production of a jelly or gum having highly desirable flavor complexes and food characteristics.

A still further object is to provide a low cost jelly made from pure sugar cane constituents and from a basic water dispersible, edible, sugar containing bar or brick which may be easily and conveniently transported at low cost and occupying a minimum of space.

A still further object is to provide a substantially dehydrated jelly and a substantially pure table syrup of maple like character, preferably in the form of a solid block which may be easily and economically transported at a great saving in space and weight and which can be reconstituted into a jelly or a pure table syrup by the ultimate consumer.

A still further object is to obtain a water dispersible, edible, sugar containing syrup or solid mass having natural fruit color and which color is obtained by the special treatment more completely outlined in this application of impure solutions and whereby as a result of the heat treatment and desirably by acidification the gray green color complex is destroyed and a stable yellow to red color is obtained.

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 accordance with the procedures of the present invention, the sugar compositions are chosen so that for every 100 parts of total non-sugar impurities or total ash present in the final product, between 10 parts and 50 parts and preferably between 25 parts and 45 parts are refined non-sugar impurities or ash derived therefrom and the balance which constitutes the major proportion is original non-sugar impurities or ash derived therefrom. In addition, the ash content of the final combination which contains a minor proportion of refined non-sugar impurities and a major proportion of original non-sugar impurities is between 0.4% and 2.0% total ash based upon total solids and preferably between 0.5% and 1.0% total ash. Therefore, of the total ash content of the final combination of 0.4% to 2.0%, between 10% and 50% of the said ash and preferably between 25% to 45% is derived from those sugar compositions which contain the refined non-sugar impurities such as molasses or "green" cane sugar syrup. The balance of between 90% and 50% of the said ash is derived from those sugar compositions which contain the original non-sugar impurities such as cane juice, raw cane sugar, washed raw cane sugar and the outer syrup film removed from raw sugar crystals.

For example, in arriving at the proper combination of sugars containing the desired proportion of refined non-sugar impurities and original non-sugar impurities and having the desired ash level, the following combinations may be utilized.

Example A

12 parts washed raw cane sugar containing about 0.6% original non-sugar impurities—this being the sugar left after the surface film of more impure sugars has been washed away and this sugar containing about 0.2% total ash based on total solids.

4 parts "green" cane sugar syrup—this being the syrup which results after several stages of crystallization to remove the more highly refined sugar and which syrup has also been put through charcoal and possibly carbonate or phosphate treatment, this syrup having an ash content of about 0.8% and containing about 2.4% refined non-sugar impurities.

1 part syrup removed by washing the raw cane sugar crystals at the centrifuge, the sugar having an ash content of 2.2% based upon total solids and containing about 6.6% original non-sugar impurities.

Example B

4 parts of raw cane sugar (having an ash content of 0.5% and containing about 1.5% original non-sugar impurities.)

2 parts "green" cane sugar syrup—this being the syrup which results after several stages of crystallization to remove the more highly refined sugar and which syrup has been put through charcoal and possibly carbonate or phosphate treatment, this syrup having an ash content of about 0.8% and containing about 2.4% refined non-sugar impurities.

Example C

1 part lime treated cane juice being the juice expressed from the sugar cane and after liming (having an ash content of 2.0% and containing about 6% original non-sugar impurities).

5 parts washed raw cane sugar containing about 0.6% original non-sugar impurities—this being the sugar left after the surface film of more impure sugars has been washed away and this sugar containing about 0.2% total ash based on total solids.

2 parts "green" cane sugar syrup—this being the syrup which results after several stages of crystallization to remove the more highly refined sugar and which syrup has also been put through charcoal and possibly carbonate or phosphate treatment, this syrup having an ash content of about 0.8% and containing about 2.4% refined non-sugar impurities.

Example D

4 parts "green" cane sugar syrup—this being the syrup which results after several stages of crys-

tallization to remove the more highly refined sugar and which syrup has also been put through charcoal and possibly carbonate or phosphate treatment, this syrup having an ash content of about 0.8% and containing about 2.4% refined non-sugar impurities.

3 parts syrup removed by washing the raw cane sugar crystals at the centrifuge, the sugar having an ash content of 2.2% based upon total solids and containing about 6.6% original non-sugar impurities.

12 parts refined sweetening agent such as sucrose, dextrose, glucose or corn syrup.

This combination of sugars containing the original non-sugar impurities and the refined non-sugar impurities in their proper proportions is then subjected to an elevated temperature treatment between about 240° F. and 275° F. or more and preferably to between 255° F. and 260° F.

The heat treatment may be carried out in an open kettle, but may also be conducted in a pressure chamber where the concentration of the sugar syrups is maintained while the elevated temperature is being reached.

Desirably only those sugars which contain the original non-sugar impurities are subjected to the elevated temperature treatment to react and modify the original non-sugar impurities contained therein followed by combining the sugar syrup containing the heat reacted and modified non-sugar impurities with the sugar syrup containing the refined non-sugar impurities.

The heat treatment is conducted for a sufficiently long period of time to complete the reaction and modification of the original non-sugar impurities such as for a period of between several minutes and one hour. The time during which the sugar is subjected to the elevated temperature depends upon the elevated temperature. The higher the temperature to which the sugar is subjected, the shorter the time that is required completely to react and modify the original non-sugar impurities.

Following the elevated temperature treatment the undissolved coagulated or precipitated material is removed as by filtration or centrifugalization or by sedimentation or decantation.

For example, where the sugars referred to in Example A are subjected to a temperature of 255° F. at atmospheric pressure they may be held at that temperature for a period of from 3 to 7 minutes or subjected to a flash or instantaneous heat in a pressure chamber at 255° F. to 260° F. and the coagulated or precipitated material may then be removed.

In the filtration of the heat reacted sugar syrup it is desirable to use an inert filtration agent such as diatomaceous earth. The use of activated carbon in the filtration of the heat reacted sugar containing the original non-sugar impurities, unless the sugar syrup has been or is to be acidified, has been found to be undesirable.

Where the sugar syrup containing the original non-sugar impurities has been heat reacted and modified and then filtered, there may then be added to the syrup other cane syrup or cane sugar materials which contain refined non-sugar impurities so that to every 100 parts of total non-sugar impurities there are present between 10 parts and 50 parts of refined non-sugars and between 90 parts and 50 parts of original non-sugar impurities.

Where the combination of sugars containing

original and refined non-sugar impurities in their proper proportion contains a total ash content higher than 2.0% as specifically set forth in the present invention, and the content is to be reduced to the desired level, between 0.4% and 2.0%, there may be added to the combination a sweetening agent such as refined sucrose, dextrose or other sweetening agent, as set forth in Example D.

The elevated temperature treatment to react and modify the original non-sugar impurities may be conducted by heat treating the entire mass or by heat treating only those sugars which contain the original non-sugar impurities followed by filtration and then combining with the sugars containing the refined non-sugar impurities and the sweetening agent.

The syrup thus obtained, after a period of about 12 to 24 hours, then assumes a highly desirable maple-like flavor and may readily be used as a maple flavored table syrup or in the manufacture of bakery products, candies and confections, puddings, ice cream, ices and sherbets, and beverages.

The syrup also has been found highly satisfactory for use in the preparation of fruit flavored foods including jellies or gums whereby by the addition of acid to produce a pH of between 2.5 and 3.2 and sufficient pectin to jellify the mass there is obtained a highly desirable fruit flavor which is obtained without the addition of fruits or imitation or natural fruit flavors.

The syrup of the present invention may also be readily reconstituted into solid brick or bar form. The preferred method is to concentrate the syrup thus obtained in a vacuum pan at a temperature not exceeding about 160° F. until the syrup is supersaturated. As soon as supersaturation of the syrup is obtained in the vacuum pan at a temperature not in excess of about 160° F. there is added to the vacuum pan a quantity of sugar particles having a fineness of at least 250 mesh on the Tyler screen. The concentrating is then continued and the temperature is maintained at not in excess of 160° F. As the percentage of total solids increases in the syrup in the vacuum pan, an additional quantity of the fine sugar particles is added. This process is repeated several times during which evaporation in the vacuum pan is continued at the fastest possible rate in the highest vacuum and at a temperature not in excess of about 160° F. The mass is preferably agitated during this procedure although agitation is not required.

This process is continued until the mass in the vacuum pan reaches a point where it consists of a large proportion of undeveloped sugar crystals of small size and which sugar crystals have not been allowed to grow by reason of the special treatment given the mass in the pan and a small proportion of the saturated syrup phase. When the mass in the vacuum pan reaches a total concentration of between about 90 and 96 Brix, the mass is allowed to flow into containers or molds where upon cooling and solidification a solid mass or brick or bar is obtained.

The free flowing pre-grained sugar composition in its concentrated form of between 90 and 96 Brix may be poured into molds or boxes or containers and allowed to cool whereby a hard solid mass or brick is obtained. Desirably the walls of the container into which the concentrated pre-grained sugar mass is poured should be either brushed with oil or waxed or waxed paper liners should be used so that after solidification of the

sugar syrup the brick or bar can be removed cleanly from the container in which it is packed.

After about 12 to 24 hours aging the brick or bar assumes a highly desirable maple-like flavor and this brick or bar can be utilized as a basis for candies and confections, ice cream, ices or sherbets, for a table syrup or in the manufacture of novel jellies or gums.

For example, the bar or brick may be added to water, preferably to boiling water, to produce a syrup of desired density and preferably a saturated solution which has the character of a maple flavored table syrup. The finished syrup has the characteristics of a fine maple syrup and is far superior in flavor and aroma to the ordinary blends of cane sugar and maple syrup commonly sold as a table syrup.

This processing of the impure sugar solutions in this manner causes a chemical modification of the sugar cane impurities whereby the objectionable flavors of the sugar cane impurities are changed into a highly desirable aroma and flavor which is non-volatile and which will withstand long boiling periods even at substantially elevated temperatures.

Where it is desired to convert the bricks into a jelly the proper amount of pectin or pectinous material is added to the reconstituted bar with additional acid to produce a pH between 2.8 and 3.5 and desirably to a pH of about 3.2. Upon allowing to "set" there is obtained a fruit type jelly which has unusually desirable flavor and aroma characteristics and which flavors and aroma are non-volatile and non-oxidizable, these being produced by the acid reaction of the present invention. Furthermore, the finished jelly has a color which is the same as if natural fruits had been used in the jelly so that to all outward appearances the jelly thus obtained is a natural fruit jelly made from pure fruit materials and refined sugar.

The brick or bar obtained in accordance with the procedures of the present invention can therefore be utilized for one of a number of food compositions and in its brick or bar form may be readily transported in concentrated form at low cost and with a minimum of packaging material. For example, when the bar is shipped in lieu of table syrup approximately 50% of the space normally occupied by the table syrup is saved and furthermore neither cans nor bottles are required for shipment of the bar as the bar can be formed directly in cardboard or wax paper containers or may be formed in metal or rubber molds and then shipped in brick form.

Where it is desired to produce only the jelly from the bar, then the desired amount of acid to produce a pH between 2.8 and 3.5 as well as the desired amount of pectin is directly added to the sugar composition in syrup form and immediately after the sugar syrup has been subjected to the elevated temperature treatment of 240° F. to 275° F. The flavor of the jelly having the unusual fruit flavor characteristics is accomplished without the addition of any fruit flavor or fruit essential oils from natural or synthetic sources which are normally responsible for flavors contained in the pure fruit jelly.

It has been found particularly desirable in producing the maple flavor characteristics to acidify the sugar composition containing the original and refined non-sugar impurities and particularly the sugar composition containing the original non-sugar impurities to a pH of between 4.7 and 5.8 and desirably between pH 4.9 and 5.1, the acidification being conducted desirably before or during the heat modification and followed by filtration of the insoluble materials formed by the heat and acid modification. Hydrochloric acid is desirably used for the purpose of this acid adjustment and acid reaction and the acidification is applied preferably to the sugar composition containing the original non-sugar impurities.

The sugar composition containing the original non-sugar impurities is desirably acid reacted to the desired pH of 4.7 to 5.8 before or during the elevated temperature treatment to in excess of 240° F. followed by removal of the insoluble products formed by the acid and heat reaction.

As a less desirable procedure, the entire sugar composition containing the original and refined non-sugar impurities may be acid reacted after the heat modification but the most desirable results of the present invention are obtained by the acid reaction being conducted before or simultaneously with the heat reaction.

Where the sugar composition containing the original non-sugar impurities is acid and heat reacted before combining with the proper proportion of the sugar composition containing the refined non-sugar impurities, it has been found desirable to acidify the former sugar composition containing the original non-sugar impurities to a sufficiently low pH so that upon combining with the latter sugar composition containing the refined non-sugar impurities, the acidity of the final combination will be within the desired range of between pH 4.7 and 5.8.

Although hydrochloric acid is particularly desired for this acidification, other acids, preferably the non-oxidizing and non-reducing acids may be used such as phosphoric acid, sulphuric acid, tartaric acid or citric acid.

By the addition of the acid a chemical reaction occurs between the non-sugar impurities of the sugar compositions and the added acid whereby a modification takes place to change the flavor complexes into highly desirable flavors and aromas. This acid reaction further develops taste and aroma complexes and is apart from the reaction which takes place as a result of the elevated temperature treatment.

Preferably, the combination of the two reactions, the first being the heat reaction and the second being the acid reaction, produces the most desirable results of the present invention.

As a result of the acid reaction there is also obtained a reduction in total color as well as a complete stabilization of the color which makes the product more readily adaptable and useful for a table syrup, jelly, and other food purposes. The reduction of intensity and the stabilization of the color of the modified sugar are of great importance and greatly enhance the usefulness of the modified sugar.

Where it is desired to form a brick of the final composition, the acidification is conducted after elevated temperature treatment and after heat modification have taken place. Where, however, the final product is to be retained in syrup form or in solution, the acidification and heat modification may be conducted simultaneously and the acid reacted syrup may be subjected to the heat modification followed by filtration or removal of the coagulated or precipitated materials in accordance with the procedures of the present invention.

The pH adjustment of between 4.7 and 5.8 and desirably between 4.9 and 5.1 appears to represent the critical limits, which acidity appears to

complete the modification of the objectionable tasting materials and to give the highly desirable flavor complexes to the product produced in accordance with the present invention.

Where the polycarboxylic aliphatic acids such as tartaric acid, citric acid, malic acid and their acid salts as well as other acids such as lactic acid, glycollic acid and phosphoric acid and also dibasic acids such as succinic acid and malonic acid as well as the sugar acids such as gluconic acids and saccharic acid are utilized, the acids themselves should be free of noticeable flavor and should be used for the sole purpose of reacting the impurities of the raw sugar materials to produce the flavor complexes desired and the acids must be added in a sufficient quantity to produce the effective acidity in terms of pH concentration.

It has not been found desirable, however, to use reducing acids of the nature of sulphurous acid or oxidizing acids such as nitric acid which appear to form objectionable constituents.

The novel brick produced in accordance with the present invention upon reconstitution with water forms the maple flavored table syrup.

The heat and acid reacted sugar composition thus obtained which in brick or bar or table syrup form has the characteristics of a maple flavored product has no characteristic whatever of the sugars or sugar compositions containing the refined or original non-sugar impurities used in the production of the brick or bar. Furthermore where a jelly is formed the jelly bears no resemblance whatever to the original constituents used to produce the sugar composition.

The ash content or the non-sugar impurities content may where desired be adjusted by blending or admixture with other intermediate sugar products or sugar residues or by the addition of sucrose, dextrose, glucose or other sweetening agents in order to reach the desired ash or non-sugar impurities content of refined and original character. Of particular importance is the fact that these novel flavors are produced in substantially stable condition so that when used in the manufacture of other foods where additional concentration or boiling is employed, the aromatic constituents and flavor complexes are fully retained.

For example, where the pH has been adjusted to between 2.8 and 3.5 as in the preparation of the jelly and where a confectionery gum is produced, high temperature treatments are involved. These gums are now limited to the use of artificial flavoring ingredients which artificial flavors consisting principally of essential oils are readily volatilized. In accordance with the procedures of the present invention, the maple flavored product at the pH between 4.7 and 5.8 may be further acidified to a pH between 2.8 and 3.5 and subjected to prolonged and high temperature treatments and the finished product will fully retain its desirable flavor and aromatic characteristics.

Furthermore, the maple flavored syrup or bar or table syrup produced therefrom will give enhanced sweetening value and a highly desirable flavor to candies and confections, puddings, bakery products, beverages, icings, ice cream, sherbets and ices. It has been found particularly that the amount of sugar required in an ice cream or sherbet or in a candy can be reduced by about 20% to 30% when using the maple flavored product of the present invention as although the amount of sucrose or other carbohydrates which it contains is not in excess of other sugar compositions nevertheless the sweetening value appears to be greater.

It has also been found that where the maple flavored sugar composition of the present invention is utilized in the preparation of food products where other flavoring materials are used such as in the preparation of chocolate ice cream, chocolate puddings, fruit ices or sherbets, butterscotch puddings, etc., that the amount of artificial or natural flavor, such as of chocolate, fruit flavor or other flavor can be reduced by between 20% and 40% without reduction in total flavor. In other words, the maple flavored sugar composition of the present invention has unusual value for blending in other food products to enhance and bring out other flavors thereby requiring much less of such other flavors as well as much less of sugars that would otherwise have to be used.

Having described my invention, what I claim is:

1. A process of producing novel sugar compositions having a desirable maple flavor and being capable of manufacture into a fruit type jelly without the addition of fruit flavors which comprises preparing a combination of cane sugar constituents, said combination having an ash content of between 0.4% and 2% based upon the solids present and said combination also comprising (*a*) a material selected from the group consisting of molasses and "green" cane sugar syrup, which material is present in a sufficient amount to supply between 10% and 50% of the total ash content of the combination, and (*b*) a material selected from the group consisting of cane juice, raw can sugar, washed raw cane sugar and the outer sugar film of raw cane sugar crystals, which latter material is present in a sufficient amount to supply between 90% and 50% of the total ash content of the combination, heating to a temperature of between 240° F. and 275° F. and then removing the undissolved materials.

2. A process of producing novel sugar compositions having a desirable maple flavor and being capable of manufacture into a fruit type jelly without the addition of fruit flavors which comprises preparing a combination of cane sugar constituents, said combination having an ash content of between 0.4% and 2% based upon the solids present and said combination also comprising (*a*) a material selected from the group consisting of molasses and "green" cane sugar syrup, which material is present in a sufficient amount to supply between 10% and 50% of the total ash content of the combination, and (*b*) a material selected from the group consisting of cane juice, raw cane sugar, washed raw cane sugar and the outer sugar film of raw cane sugar crystals, which latter material is present in a sufficient amount to supply between 90% and 50% of the total ash content of the combination, acidifying to a pH of between 4.7 and 5.8, heating to a temperature of between 240° F. and 275° F. and then removing the undissolved materials.

3. A process of producing desirable sugar compositions having a maple flavor and being capable of manufacture into a fruit type jelly without the addition of fruit flavors and having an ash content of between 0.4% and 2%, which comprises providing a material selected from the group consisting of molasses and "green" cane sugar syrup which material is present in a sufficient amount to supply between 10% and 50%

of the total ash content of the composition, reacting and modifying said material by heating to between 240° F. and 275° F., removing the undissolved materials, and then combining said heat reacted and modified material with a material selected from the group consisting of cane juice, raw cane sugar, washed raw cane sugar and the outer syrup film of raw cane sugar crystals which material is present in a sufficient amount to supply between 90% and 50% of the total ash content of the composition.

4. A sugar composition having an ash content of between 0.4% and 2%, said composition containing (*a*) the heat reaction products of a material selected from the group consisting of molasses and "green" cane sugar syrups which material is present in a sufficient amount to supply between 10% and 50% of the total ash content of the composition, and (*b*) a material selected from the group consisting of cane juice, raw cane sugar, washed raw cane sugar and the outer syrup film of raw cane sugar crystals which material is present in a sufficient amount to supply between 90% and 50% of the total ash content of the composition.

5. A sugar composition having an ash content of between 0.4% and 2%, said composition containing (*a*) the heat reaction products of a material selected from the group consisting of molasses and "green" cane syrup which material is present in a sufficient amount to supply between 10% and 50% of the total ash content of the composition, said heat reaction products having been formed by heating the material to between about 240° F. and 275° F., and (*b*) a material selected from the group consisting of cane juice, raw cane sugar, washed raw cane sugar and the outer syrup film of raw cane sugar crystals which material is present in a sufficient amount to supply between 90% and 50% of the total ash content of the composition.

6. A sugar composition having a desirable maple flavor and being capable of manufacture into a fruit type jelly without the addition of fruit flavors, said sugar composition having an ash content of between 0.4% and 2% and containing the heat reaction products of a combination comprising (*a*) a material selected from the group consisting of molasses and "green" cane sugar syrup which material is present in a sufficient amount to supply between 10% and 50% of the total ash content of the combination, and (*b*) a material selected from the group consisting of cane juice, raw cane sugar, washed raw cane sugar and the outer syrup film of raw cane sugar crystals which material is present in a sufficient amount to supply between 90% and 50% of the total ash content of the combination.

7. A sugar composition having a desirable maple flavor and being capable of manufacture into a fruit type jelly without the addition of fruit flavors, said sugar composition having an ash content of between 0.4% and 2% and containing the heat reaction products of a combination comprising (*a*) a material selected from the group consisting of molasses and "green" cane sugar syrup which material is present in a sufficient amount to supply between 10% and 50% of the total ash content of the combination, and (*b*) a material selected from the group consisting of cane juice, raw cane sugar, washed raw cane sugar and the outer syrup film of raw cane sugar crystals which material is present in a sufficient amount to supply between 90% and 50% of the total ash content of the combination, the said sugar composition having a pH of between 4.7 and 5.8.

8. A sugar composition having an ash content of between 0.4% and 2%, said composition containing (*a*) the heat reaction products of a material selected from the group consisting of molasses and "green" cane sugar syrups which material is present in a sufficient amount to supply between 10% and 50% of the total ash content of the composition, and (*a*) a material selected from the group consisting of cane juice, raw cane sugar, washed raw cane sugar and the outer syrup film of raw cane sugar crystals which material is present in a sufficient amount to supply between 90% and 50% of the total ash content of the composition, the said sugar composition having a pH of between 4.7 and 5.8.

9. A process of preparing a sugar composition having a desirable flavor and being capable of being manufactured into fruit flavored jellies without the addition of fruit flavors thereto, said sugar composition having an ash content of between 0.4% and 2%, which comprises combining two materials, namely, (*a*) about 12 parts by weight of the washings of raw cane sugar containing 0.6% non-sugar impurities and (*b*) 4 parts by weight of green cane sugar syrup left as a residue after several stages of crystallization, said last mentioned green cane syrup having an ash content of about 0.8% and containing about 2.4% refined non-sugar impurities; and (*c*) about 1 part by weight of sugar syrup removed by washing raw cane sugar crystals in a centrifuge, the sugar having an ash content of 2.2% based upon total solids and containing about 6.6% original non-sugar impurities, and then subjecting this combination to an elevated temperature treatment between about 240° F. and 270° F.

10. A process of preparing a sugar composition having a desirable flavor and being capable of being manufactured into fruit flavored jellies without the addition of fruit flavors thereto, said sugar composition having an ash content of between 0.4% and 2%, which comprises combining two materials, namely, (*a*) about 4 parts by weight of raw cane sugar having an ash content of 0.5% and containing about 1.5% original non-sugar impurities, and (*b*) about 2 parts by weight of green cane sugar syrup resulting after several stages of crystallization to remove the more highly refined sugar, this last mentioned syrup having an ash content of about 0.8% and containing about 2.4% refined non-sugar impurities, and then subjecting this combination to an elevated temperature treatment between about 240° F. and 270° F.

11. A process of preparing a sugar composition having a desirable flavor and being capable of being manufactured into fruit flavored jellies without the addition of fruit flavors thereto, said sugar composition having an ash content of between 0.4% and 2% which comprises combining three materials, namely, (*a*) about 1 part by weight of lime treated cane juice having an ash content of 2.0% and containing about 6% original non-sugar impurities, and (*b*) about 5 parts by weight of washed raw cane sugar containing about 0.6% original non-sugar impurities, being the residue left after the surface film of the more impure sugars has been washed away and containing about 0.2% total ash based upon total solids, and (*c*) about 2 parts by weight of green cane sugar syrup resulting after several stages

of crystallization and removal of the more highly refined cane sugar, this syrup containing an ash content of about 0.8% and about 2.4% refined non-sugar impurities; and then subjecting this combination to an elevated temperature treatment between about 240° F. and 270° F.

ALEXANDER M. ZENZES.

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