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# SWEETENING COMPOSITION AND METHOD OF PRODUCING THE SAME

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This invention relates to a low calory sweetening composition in pulverulent form, dispensible by volume in much the same manner as granular sugar (e.g., by the cup, tablespoon, or teaspoon), and which is particularly adapted for household use.

The new low calory sweetening composition is a porous, spongelike material made up of fine particles of sugar and of synthetic sweetener agglomerated into granules comparable, e.g., to the size of granulated sugar, but having a bulk density of e.g. around one-half that of granulated sugar.

Present non-caloric sweeteners, such as saccharine and cyclamates, are put up as solutions or as pills, and dispensed and used as drops or multiple drops of the solutions or as one or more individual pills. Without special effort, it is impossible to split the dosage to a part of a pill or a fraction of a drop. Sweetening of fruits, cereals and the like is difficult with such solutions, and almost impossible with pills. There are also certain psychological factors which limit the use of such non-caloric sweeteners. When used in cooking, the straight synthetic sweeteners provide no browning reaction.

The improved low calory compositions of the present invention overcome, to a large extent, the objections to the use of the non-caloric sweeteners by themselves and provide a new sweetening composition which can be used like sugar and which has a sweetness comparable to that of sugar, but which has only a fraction of the calories of a comparable volume of granular sugar.

The new composition is made by combining fine pulverized sugar together with fine synthetic sweetener, in proper proportions, into porous, spongelike agglomerates or granules of low bulk density, and with the agglomerates or granules of a size such that they can be used in much the same manner that granular sugar is used as a sweetener, and with a similar sweetening action.

The finely divided sugar which is used in making the new composition may be ordinary powdered sugar such as 6X or 10X powdered sugar. Such powdered sugar is made by grinding granular sugar to the desired fineness. The synthetic sweetener can be separately pulverized or ground to the desired size if it is not already in a sufficiently finely divided state. Or the synthetic sweetener can be admixed with the granular sugar before grinding and the admixture ground together. Alternatively and advantageously, the synthetic sweetener can be admixed with a small part of the granular sugar as a preliminary step of the process, and the resulting preliminary mixture then mixed with the larger amount of granular sugar.

The synthetic sweeteners which are used in making the new compositions are water-soluble synthetic sweeteners such as soluble saccharine, calcium cyclamate or sodium cyclamate, or mixtures of two or more such sweeteners. Where the saccharine is in the form of a coarse powder, it is separately ground before admixture with the pulverized sugar or is admixed with the granular sugar and ground at the same time.

The sugar which is particularly advantageous in the new compositions is ordinary household sugar or sucrose, but other sugars or mixtures of sugars can be used, including dextrose, etc.

The proportions of sugar and synthetic sweetener will

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in general be such that the resulting granular porous spongelike product will have a sweetness similar to or comparable with that of a similar volume of granular sugar. With a bulk density of the porous spongelike product equal to about one-half that of granular sugar, the amount of sugar by weight in the porous granular product will be approximately one-half that of the granular sugar, and the amount of synthetic sweetener will be sufficient to impart an over-all sweetness comparable with that of granular sugar. With a bulk density of one-third that of granular sugar the amount of synthetic sweetener will supply about two-thirds of the sweetness; with a bulk density of about 60% that of granular sugar the amount of synthetic sweetener will supply about 40% of the sweetness.

The conversion of the finely divided sugar and synthetic sweetener into the form of an agglomerated product is accomplished by moistening the surfaces of the particles and agitating the particles to cause agglomeration of the fine, moistened particles to form agglomerates of a spongelike character and low bulk density, and by drying the agglomerates, and with screening, if necessary, to separate oversize granules and fines. Methods suitable for accomplishing such formation of agglomerate products of low bulk density are described in U.S. Patents Nos. 2,893,871 and 2,900,256, and French Patent No. 1,136,468.

The invention will be further described in connection with the following specific examples, illustrating different compositions, but it will be understood that the invention is not limited thereto.

The examples illustrate the use of different sugars, and different synthetic sweeteners, in which the amount of synthetic sweetener is approximately equal, in sweetening power, to the amount of sugar with which it is used, so that, with the production of a porous, spongelike granular product having half the bulk density of granular sugar, the composition will have a sweetness comparable with that of an equal volume of granular sugar. As the bulk density of the product is varied to a somewhat higher or lower bulk density, the sweetening power of the composition can be similarly varied to one which is somewhat greater than or somewhat less than that of a corresponding volume of granular sugar.

For purposes of determining the approximate amounts of synthetic sweetener and sugar to be used, if the sweetening power of sugar is taken as 1, that of anhydrous dextrose is around 0.66; that of saccharine, around 300; that of sodium or calcium cyclamate, around 30; and where a 9:1 ratio of saccharine to cyclamates is used, around 57.

The following examples are on the basis of approximately 20 pounds of sugar with an amount of synthetic sweetener approximately equal in sweetening power to that of the sugar. In each case, the mixture of sugar and synthetic sweetener is ground, in a suitable mill such as a micropulverizer or Bauermeister U–Z–U–00 mill, to a fineness corresponding to around 10X sugar.

*Example 1.*—A mixture was made of 20 pounds of fine, granular sugar and 30 grams of sodium saccharine, the mixture was ground, and the finely powdered mixture subjected to agglomeration, and drying of the agglomerates, to form a porous spongelike granular product of low bulk density, approximating one-half that of the granular sugar.

*Example 2.*—A similar mixture was prepared and used in which 20 pounds of fine, granular sugar were combined with 300 grams of sodium cyclamate.

*Example 3.*—A similar mixture was made in which the initial mixture was 20 pounds of fine, granulated sugar and 300 grams of calcium cyclamate.

*Example 4.*—A mixture of sodium cyclamate and so-