HYDROCOLLOID CONFECTIONERY

FIELD OF THE INVENTION

The present invention relates to hydrocolloid confectionery and more especially to hydrocolloid confectionery products containing one or more hydrocolloids, generally referred to as gums and jellies.

BACKGROUND OF THE INVENTION

Hydrocolloid confectionery includes sugar gels which are products comprising a gelling agent in a sugar/glucose syrup system, for instance, gums and pastilles, and water gels which are products comprising a gelling agent in water, for instance, table jelly. Hydrocolloid confectionery now represents about half of the sugar confections sold and their popularity continues to grow. Hydrocolloids are the key ingredients of this class of confectionery. They gel and thicken but also stabilise by preventing syneresis, fixing flavours and inhibiting sugar crystallisation, give transparency, brilliance, adhesion and ease foaming for aerated jellies.

Some examples of hydrocolloids used in hydrocolloid confectionery are agar agar (agarose), xanthan gum, gellan gum, gum arabic, pectin, gelatin, carrageenan, and modified and/or unmodified starches. One of the most common hydrocolloids used in hydrocolloid confectionery is gelatin used primarily as a gelling agent and imparts to the hydrocolloid confectionery a unique gelatin texture especially desirable to consumers. However, food-grade gelatin is obtained from bovine or porcine raw materials and the use of gelatin is undesirable not only because of concerns about bovine spongiform encephalopathy (i.e. "BSE" or "mad-cow disease), but also for the vegetarian population, as well as for certain ethnic groups who have concerns about the nature of meat used in certain food products and/or who observe certain dietary constraints concerning the consumption of meat and dairy products. In addition gelatin, being a protein, is highly sensitive to thermal and high

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acidic treatment and undergoes degradation causing loss in its functional properties, reduced cooking efficiencies, loss of active ingredient, and possible fouling which necessitates frequent cleaning.

Attempts have been made to replace gelatin by one or more of the above hydrocolloids in a variety hydrocolloid confectionery materials but with little success in the case of edible gums. For example, USP 5,422,134 describes a comestible product comprising a gelling agent composition comprising depolymerised locust bean gum having an intrinsic viscosity of from 1.3 to 2.3 dl/g and a polysaccharide or mixture of polysaccharides that forms a gel in aqueous solution with locust bean gum. Example 6 describes the preparation of a wine gum comprising such a gelling agent but we found, when following the procedural steps of the Example, we were only able obtain a weak and unstable gel whose texture was not gelatin like at all.

SUMMARY OF THE INVENTION

We have found, surprisingly, that by using iota-carrageenan or a mixture of carrageenans containing predominantly iota-carrageenan instead of gelatin as a gelling agent in a hydrocolloid confectionery product, we can overcome the disadvantages of gelatin and yet still provide the gelatin texture preferred by many consumers. Iota-carrageenan gives elastic, bouncy, long lasting and non-sticky characteristics similar to gelatin-like texture.

Accordingly, the present invention provides a hydrocolloid confectionery product comprising iota-carrageenan or a mixture of carrageenans containing more than 50% iota-carrageenan.

DETAILED DESCRIPTION OF THE INVENTION

Hydrocolloid confectionery products include sugar gels and water gels, for example, hard, soft and foamed gums, wine gums, laces, tubes and corrugated strips, jujubes, fruit leathers, fruit pastilles, lemon slices,

pastilles, Turkish delight, gummi bears, jelly babies, table jellies, savoury gels, etc.

Carrageenan is a polysaccharide gelling agent that is usually extracted from seaweed and the extraction usually yields a mixture of at least two types, i.e. two or more of the iota, kappa and lambda types, the amounts of each depending on the seaweed used and the extraction conditions. Carrageenan usually also contains salt, for instance, in an amount up to about 3% by weight. In this invention, a mixture of carrageenans containing at least 60% iota-carrageenan is used, preferably at least 70%, more preferably at least 80% and especially at least 90% iota-carrageenan by weight based on the total weight of the carrageenan. The iota-carrageenan gives the dominant gelatin like behaviour to the hydrocolloid confectionery product.

The amount of carrageenan in the hydrocolloid confectionery product may be from 0.1% to 5.0%, preferably from 0.25% to 4% and more preferably from 0.5% to 3% by weight based on the weight of the hydrocolloid confectionery product.

If desired, one or more other hydrocolloids may be present together with the carrageenan in the hydrocolloid confectionery product, e.g. agar agar, xanthan gum, locust bean gum, gellan gum, gum arabic, pectin, gelatin, kappa-carrageenan, guar gum, or modified or unmodified starches, e.g. maize or potato starch. The use of one or more other hydrocolloids together with the carrageenan enables the creation of different gelling characteristics as desired and/or may be used to manipulate the textural properties.

The hydrocolloid confectionery product of the present invention typically comprises in addition to iota-carrageenan, water, sugar , glucose syrup, gelatin, other carrageenans and/or other hydrocolloids, colour, flavour and acids.

When the hydrocolloid confectionery product of the present invention is a sugar gel, this usually contain from 30% to 90%, preferably from

40% to 70% of syrup of sugars by weight based on the weight of the hydrocolloid confectionery product e.g. corn syrup, glucose syrup, invert syrup, high fructose syrup, sucrose, fructose, maltose, and/or sugar replacers, e.g. isomalt, maltitol, sorbitol, mannitol, lactitol, trehalose. Different types of sugar systems can be used to manipulate the final textural properties of the hydrocolloid confectionery product. This is used to influence the viscosity and processing parameters e.g. depositing temperature.

In addition to the carrageenan and the sugar systems optionally together with other hydrocolloids , the hydrocolloid confectionery product may contain the usual ingredients such as a food-acceptable acid. e.g. lactic acid, malic acid, tartaric acid, ascorbic acid, hydrochloric acid or citric acid in an amount of from 0.5% to 5% and preferably from 1.0% to 2.5% by weight based on the weight of the hydrocolloid confectionery product ; a food-acceptable acid salt in an amount of from 0.25% to 2.5% and preferably from 0.5% to 1.5% by weight based on the weight of the hydrocolloid confectionery product; a humectant such as glycerol, flavour, colour, protein, e.g. egg white, milk protein in the case of aerated system, in an amount of from 0.1% to 1% and preferable from 0.2-0.5% by weight based on the weight of the hydrocolloid confectionery product; and water. The amount of water in the finished hydrocolloid confectionery product may be from 10% to 25% and preferably from 12.5% to 22.5% by weight based on the weight of the hydrocolloid confectionery product.

The hydrocolloid confectionery sugar gel products of the present invention may be prepared by conventional methods. For example, the ingredients may be blended to form a syrup, then cooked, shaped and, if necessary, dried. Drying is usually required to achieve the final total solids and the final texture is influenced by drying process. Drying is not required if the liquor is deposited at the total solids of the finished products or if it is processed by starchless moulding. As for the ingredients, the processing method will affect the final texture of products.

The ingredients may be blended with agitation, e.g. stirring. The syrup of sugars, carrageenan, and water are preferably blended first followed by the remaining additives, e.g acid, flavour, colour, humectants, etc. to give a syrup having a solids content of from 60% to 90% and preferably from 65% to 75% by weight based on the weight of the syrup.

The syrup may be cooked by open pan boiling, in a jet cooker, coil cooker, plate heat exchanger or a cooker extruder. Depending on the cooking equipment, ingredients formulation, concentration at forming , the operating condition will vary.

The shaping may be carried out, for instance, by filling moulds by casting, depositing (starch or starchless) or injection, slabbing (flat or contoured), layering or extrusion.

The iota-carrageenan or mixture of carrageenans containing more than 50% iota-carrageenan sets rapidly or instantly and allows a quick forming during the depositing step. The setting time depends on parameters such as the temperature, concentration, pH, ionic strength etc. The setting temperature is preferably at least 95°C.

The shaped product may be dried, for instance by stoving which is a dehydration process at a specific temperature, humidity and time which parameters may be readily selected by those skilled in the art. Depending on whether or not the cooked syrup is subjected to a stoving process, different gumminess and/or elasticity may be obtained.

The product may also be subjected to one or more of other finishing treatments as desired depending on the product and the requirements, e.g. washing, destarching, steaming, sanding, crystallisation, and oiling and polishing, or engrossing with other sugar confectionery products.

The final solids content may be from 75% to 90% and preferably from 77.5% to 87.5% by weight based on the weight of the hydrocolloid confectionery .

By using different mixtures of ingredients, different processing methods or different shaping methods, hydrocolloid confectionery products with completely novel textures can be produced.

The hydrocolloid confectionery water gel products of the present invention may be prepared by blending to form a syrup, boiling and, if necessary, drying.

EXAMPLES

The following Examples further illustrate the present invention.

The following ingredients are used for a Gummi product:

Glucose syrup	60%
Water	20%
Sucrose	14%
Carrageenan	2.0% (predominantly iota carrageeanan)
Citric acid	1.7%
Tri-sodium citrate	0.9%
Flavour	0.2%

Pre heat glucose syrup and water (with Tri-sodium citrate added), to 60°C, then add the carrageenan (Genugel carrageenan type X-8300) to the solution while stirring with a high speed mixer to ensure complete dispersion, and then heat to boil. Add sugar to the slurry and boil to the required total solids. The total solids of liquors may be in the range from 60-90% depend on the subsequent forming and moulding methods.

The Gummi product has an elastic, bouncy, non-sticky, long-lasting and cohesive eating property. The texture is similar to a Gummi product prepared using gelatin.

Example 2

A similar procedure to that described in Example 1 is followed but with the addition of 1% of modified maize starch. The texture is similar to a hard gum characteristic.

Comparative Example

A similar procedure to that described in Example 1 is followed but using a carrageenan of predominantly kappa type instead of the carrageenan there used. The product does not have the elastic and bouncy texture but rather a short or less stringy texture.

CLAIMS

1. A hydrocolloid confectionery product comprising iota-carrageenan or a mixture of carrageenans containing more than 50% iota-carrageenan.

2. A hydrocolloid confectionery product according to claim 1 wherein the amount of iota-carrageenan in the product is from 0.1% to 5.0% by weight by weight based on the weight of the product.

3. A hydrocolloid confectionery product according to claim 1 wherein one or more other hydrocolloids are present together with the iota-carrageenan in the edible gum.

4. A hydrocolloid confectionery product according to claim 3 wherein the other hydrocolloid is agar agar, xanthan gum, locust bean gum, gellan gum, gum arabic, pectin, gelatin, kappa-carrageenan, guar gum or a starch or protein including milk and cereal .

5. A hydrocolloid confectionery product according to claim 1 which contains from 30% to 90% of syrup of sugars by weight based on the weight of the edible gum.

6. A hydrocolloid confectionery product according to claim 1 wherein the amount of water in the finished hydrocolloid confectionery product is from 10% to 25% by weight based on the weight of the hydrocolloid confectionery product .

7. A process for the preparation of a hydrocolloid confectionery product as claimed in claim 1 which comprises blending the ingredients to form a syrup, cooking the syrup, shaping the cooked ingredients and, if necessary, drying.

8. A process according to claim 7 wherein the ingredients are blended with agitation to give a syrup having a solids content of from 60% to 90% by weight based on the weight of the syrup and cooking the syrup



to a solids content of from 75% to 90% by weight based on the weight of the cooked ingredients.

9. A process according to claim 7 wherein the syrup is cooked by open pan boiling, in a jet cooker, coil cooker, plate heat exchanger or a cooker extruder.

10. A process according to claim 7 wherein the shaping is carried out by filling moulds by casting, starch or starchless depositing, injection, flat or contoured slabbing, layering, or extrusion.

