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(54) Title: DIGESTABLE CHEWING GUM

(57) Abstract: A digestable chewing gum having a gum base comprising agar and one or more soluble ingredients mixed into the base as well as a process for its preparation.

DIGESTABLE CHEWING GUM

FIELD OF THE INVENTION

The present invention relates to an edible chewing gum, especially to a gluten-free edible chewing gum as well as a process for its preparation.

BACKGROUND OF THE INVENTION

Ordinary chewing gum contains a generally neutral and essentially tasteless insoluble masticatory gum base which is usually a plasticised rubber or polymer which is softened and has added texturisers, anti-tacking agents and antioxidants, etc. The base is to be chewed rather than eaten in itself and is a vehicle for one or more non-masticatory active ingredients such as flavours and sweeteners. On the other hand, edible chewing gum contains a base which can not only be chewed but can also be eaten and digested in addition to the non-masticatory active ingredients such as flavours and sweeteners. The base of an edible chewing gum is usually gluten-based. However, a significant disadvantage of gluten is that certain people exhibit an allergic intolerance to gluten.

JP 54044071 A describes an edible chewing gum preparation using a crosslinked gluten composition as base which is obtained from gluten and an edible crosslinking agent such as agar, by crosslinking in presence of water.

SUMMARY OF THE INVENTION

We have found surprisingly that agar can be used in low quantities in the absence or substantial absence of gluten as the edible gum base giving an edible chewing gum product which still has a desirable long-lasting cohesive chew.

According to the present invention there is provided an edible chewing gum having a gum base comprising agar and one or more soluble non-masticatory active ingredients mixed into the base.

Agar is a polysaccharide gelling agent which is extracted from red seaweed. The commercial forms available are usually strips, flakes or powders and the

molecular weight is typically over 20,000. Any commercially available form of agar is suitable in this invention.

DETAILED DESCRIPTION OF THE INVENTION

The amount of agar used as the gum base may be from 0.1% to 5% and preferably from 0.5% to 2% by weight based on the weight of the edible chewing gum. The agar has to be hydrated with water and the amount of water present is from 20 to 50% and preferably from 30 to 40% by weight based on the weight of the pre-cooking ingredient mix.

The soluble non-masticatory active ingredients mixed into the base include sweeteners, flavours, acids, colours, humectants, fats, emulsifiers, flavour enhancers, or functional ingredients such as breath fresheners, medicinal or pharmaceutical agents.

When the edible chewing gum contains sweeteners, it usually contains about 30% to 90%, preferably from 40% to 70%, by weight based on the weight of the edible chewing gum, of syrup or sugars. The syrup or sugars may be, for example, corn syrup; glucose syrup; invert syrup; high fructose syrup; (crystalline) sucrose; fructose; maltose; trehalose. Different types of sugar systems can be used to manipulate the final textural properties of the chewy confectionery product. For example, the sugar-based edible chewing gum of the present invention may contain crystalline sucrose.

If desired, the edible chewing gum may be sugar-free in which case it may contain a bulk sweetener, e.g. isomalt, maltitol, sorbitol, mannitol, lactitol, erythritol and the like.Since most of these bulk sweeteners are not as sweet as sucrose, high intensity sweeteners are advantageously employed to make sugar-free chewing gum more palatable, e.g.an artificial sweetener such as saccharin, aspartame, cyclamates, acesulfame K or thaumatin.

When the edible chewing gum contains flavours, the flavour may be any flavour that would be recognised by a person skilled in the art as suitable for a chewing gum, e.g. it may be an essential oil, a synthetic flavour, or mixtures thereof. The oil may be derived from plants or fruits such as citrus oils, fruit essences,

peppermint oil, spearmint oil, clove oil, oil of wintergreen, aniseed, etc. The flavour may be used in a sensorially aceptable amount, e.g. generally from 0.1 to 1%, preferably from 0.25 to 0.75% by weight based on the weight of the edible chewing gum.

When the edible chewing gum contains an acid, it should be a food-acceptable acid, for example, lactic acid, malic acid, tartaric acid, ascorbic acid, hydrochloric acid, or citric acid. The amount added will depend on the final product but may be in the range of from about 0.1 % to 5%, preferably from about 1% to 2.5%, by weight based on the weight of the edible chewing gum. When fruit flavours such as orange, lemon, strawberry or grape are used, fruit acids may be used to avoid a flat flavour effect.

When the edible chewing gum contains colours, humectants, fats, emulsifiers, flavour enhancers, breath fresheners, medicinal or pharmaceutical agents, each may be present in amounts suitable for their function which amounts are readily determinable by a person skilled in the art. The colour may be any food colourant within legislative limits.

When the edible chewing gum contains a humectant, the humectant may be glycerol, sorbitol or propylene glycol. When the edible chewing gum contains a fat, the fat may be added to improve masticability and mouthfeel, and to eliminate or reduce stickiness. The fat may be, for instance, hydrogenated, refined, fractionated fat with melting point from 10-50°C, preferably from 15-45°C and more preferably from 20-40°C. The amount of fat may be from 1 to 10% and preferably from 2.5 to 7.5% by weight based on the weight of the edible chewing gum. When the edible chewing gum contains an emulsifier, the emulsifier may be lecithin or ammonium phosphatide, glyceryl monostearate (GMS) or Citrem. When the edible chewing gum contains a flavor enhancer, this may be for example, talin.

When the edible chewing gum contains a functional ingredient, this may be, for instance, casein glyco macropeptide (CGMP), acid carbonate of calcium (baking soda), caffeine, guarana extracts, ginseng, herbal extracts, etc.

If desired, other hydrocolloids can be blended into the mixture of ingredients, e.g. in amounts of from 0.1-1.0% by weight based on the weight of the mixture of ingredients.

The edible chewing gum 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. The processing methods selected will affect the final texture of the products

The agar has to be dispersed in water and hydrated; then the dispersion is heated slowly and slowly brought up just below the boiling point preferably with agitation, e.g. stirring with a mixer. The solution is held, e.g. for from 1-10 minutes until the agar is dissolved below the boiling point while continually stirring with a mixer. Then the other ingredients are blended with agitation, for example, using conventional stirrers. Preferably a syrup of sugars, agar, and water are blended first, followed by the addition of the remaining additives, for example, acid, flavor, color, humectants, etc. (acid, flavor, etc. are normally added after cooking) to give a syrup having the desired final solids content.

The initial mixture of ingredients may be cooked by open pan boiling, or by for example, a coil cooker, plate heat exchanger, or a cooker extruder. The operating conditions will vary depending on the selected cooking equipment, formulation, ingredients, etc.

The product may then be shaped using conventional techniques and subjected to a cooling/drying stage as required. The moisture content of the final product may be advantageously from 5-20% by weight.

The cooking process may also include more elaborate manufacturing processes such as continuous evaporation; the inclusion of an aerating stage by beating or pulling; continuous cooling, such as, by cooling rollers; and forming operations such as extrusion, rope forming, lamination, cut and wrap forming, or dye-forming.

Example

The following example further illustrates the present invention in providing formulation and processing details for edible chewing gum with agar according to the invention. The example is intended for illustrative purposes and is not intended to be limiting. Percentages are given by weight.

Example 1

Formulation:	Percent by weight
Water	35
Agar Agar	1
Glucose syrup 42 DE	38
Sugar	20
GMS	1
Hydrogenated vegetable fat	5

The edible chewing gum is produced by a simple process employing the open pan method for cooking using a stirred steamed-jacketed confectionery boiling pan. The agar is dispersed in the recipe water and the dispersion is heated close to boiling (~ 95°C) using a high speed mixer to give rapid dispersion and the solution is held for 5 minutes with continuous stirring until the agar is dissolved below the boiling point. The remaining ingredients are then combined with this solution. The batch is heated using a steam jacket to obtain a boiling temperature, which may be in the range of 110-120°C, depending on the desired final texture.

Once the final cooking temperature is reached the mass is cooled to 80/90°C under agitation and afterwards there is added 1% citric acid @ 50TS, 0.003% Ponceau 4R colour and 0.3% strawberry flavour. The mass is finally cooled down for example by casting onto a cold slab. The product can then be apportioned as required.

CLAIMS

1. An edible chewing gum having a gum base comprising agar and one or more soluble ingredients mixed into the base.

2. An edible chewing gum according to claim 1 wherein the amount of agar used as the gum base may be from 0.1% to 5% by weight based on the weight of the edible chewing gum.

3. An edible chewing gum according to claim 1 wherein the amount of water present is from 20 to 50% by weight based on the weight of the pre-cooking ingredient mix.

4. An edible chewing gum according to claim 1 wherein the soluble non-masticatory active ingredients mixed into the base include sweeteners, flavours, acids, colours, humectants, fats, emulsifiers, flavour enhancers, breath fresheners, medicinal or pharmaceutical agents.

5. An edible chewing gum according to claim 1 wherein when the edible chewing gum contains sweeteners, it contains from 30% to 90 by weight based on the weight of the edible chewing gum, of syrup or sugars.

6. An edible chewing gum according to claim 1 wherein when the edible chewing gum is sugar-free it contains a bulk sweetener.

7. An edible chewing gum according to claim 6 wherein when the bulk sweetener is isomalt, maltitol, sorbitol, mannitol, lactitol or erythritol.

8. A process for preparing an edible chewing gum which comprises blending the agar with the other ingredients to form a syrup, then cooking, shaping, and, if necessary, drying.

9. A process for preparing an edible chewing gum according to claim 8 which comprises dispersing the agar in water and hydrating, heating the dispersion slowly and slowly bringing up to just below the boiling point with agitation,

holding below the boiling point to ensure dissolution with continuous agitation, adding the other ingredients and blending.

10. A process for preparing an edible chewing gum according to claim 8 which comprises blending and cooking a syrup of sugars, agar, and water followed by the addition of the remaining additives to give a syrup having the desired final solids content.

11. A process for preparing an edible chewing gum according to claim 10 in which the cooking is carried out by open pan boiling or continuous evaporation.

12. An edible chewing gum according to claim 1 which is gluten-free.