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(12) (19) (CA) **Demande-Application**

(21) (A1) **2,308,929**
(22) 2000/05/19
(43) 2000/11/21

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(51) Int.Cl.^{7} A23L 1/40, A23L 1/22
(30) 1999/05/21 (09/316,692) US

(54) **ARTICLE DE BOUILLON ET METHODE DE FABRICATION**
(54) **BOUILLON ARTICLE AND METHOD OF MAKING SAME**

(57) A method for making a bouillon article commences by forming a bouillon precursor particulate mixture comprising a salt, an effervescing agent (e.g., baking soda), a flavoring agent, and a bulking agent comprising maltodextrin. These ingredients are blended while adding water to achieve a moisture content of between about 1.4% and 2.2% wet weight basis. An anti-caking agent preferably is added to said blend and the hydrated blend is formed into shaped articles. The disclosed bouillon article has a moisture content of between about 1.4% and 2.2% wet weight basis, a hardness of at least about 6.5 kg, and a dissolution time in 93°C water of less than about one minute and is made from a salt, an effervescing agent (e.g., baking soda), a flavoring agent, and a bulking agent comprising maltodextrin, which are hydrated to the target moisture content, and an optional anti-caking agent added thereto for forming a blend, which is formed into the bouillon article.

BOUILLON ARTICLE AND METHOD OF MAKING SAME

ABSTRACT OF THE DISCLOSURE

A method for making a bouillon article commences by forming a bouillon precursor particulate mixture comprising a salt, an effervescing agent (*e.g.*, baking soda), a flavoring agent, and a bulking agent comprising maltodextrin. These ingredients are blended while adding water to achieve a moisture content of between about 1.4% and 2.2% wet weight basis. An anti-caking agent preferably is added to said blend and the hydrated blend is formed into shaped articles. The disclosed bouillon article has a moisture content of between about 1.4% and 2.2% wet weight basis, a hardness of at least about 6.5 kg, and a dissolution time in 93° C water of less than about one minute and is made from a salt, an effervescing agent (*e.g.*, baking soda), a flavoring agent, and a bulking agent comprising maltodextrin, which are hydrated to the target moisture content, and an optional anti-caking agent added thereto for forming a blend, which is formed into the bouillon article.

BOUILLON ARTICLE AND METHOD OF MAKING SAME

BACKGROUND OF THE INVENTION

The present invention relates generally to the preparation of bouillon products and more particularly to a bouillon product that possesses exceptional hardness and fast hot water dissolution times.

Bouillon is a convenient source of flavoring for a variety of meal preparations including, for example, soups, stews, broth's, sauces, dressings, *etc.* Instead of preparing the bouillon directly form a meat stock, for example, producers have manufactured bouillon products in the form of solid cubes or tablets. Consumers expect such bouillon products to meet several diverse criteria, including, for example, hardness to permit the bouillon product to be handled by the consumer without flaking or crumbling. Manufacturers too require hardness in order to handle and package the bouillon product. Consumers also expect the bouillon product to dissolve rapidly when placed in water or a water-based food product, such as a soup stock.

While hardness for handling and rapid water dissolution would appear to relatively easy characteristics to achieve, it must be remembered that hardness usually implies higher densities. High densities, however, usually translate into slower dissolution times. Faster dissolution times often mean lower product density (and often higher product porosity), which translates into a less hard product. Thus, these two consumer-expected performance properties are not easy to simultaneously achieve. Overlaying such diverse performance properties is the need for the bouillon products to have sufficient integrity that they can be formed into a cube product and remain a cube product during manufacturing and handling operations at the manufacturing plant, as well as during consumer handling operations in the kitchen.

CA 02308929 2000-05-19

The need for a bouillon product that can meet such diverse performance criteria exists and it is to such need that the present invention is addressed.

BRIEF SUMMARY OF THE INVENTION

A method for making a bouillon article commences by forming a bouillon precursor particulate mixture from bouillon-forming ingredients, which comprise a salt, an effervescing agent (*e.g.*, baking soda), a flavoring agent, and a bulking agent comprising maltodextrin. These ingredients are blended while adding water to achieve a target moisture content of between about 1.4% and 2.2% wet weight basis. An anti-caking agent preferably is added to said blend and the hydrated blend is formed into shaped articles. The disclosed bouillon article has a moisture content of between about 1.4% and 2.2% wet weight basis, a hardness of at least about 6.5 kg, and a dissolution time in 93° C water of less than about one minute and is made from a salt, an effervescing agent (*e.g.*, baking soda), a flavoring agent, and a bulking agent comprising maltodextrin, which are hydrated to the moisture content, and an optional anti-caking agent added thereto for forming a blend, which is formed into the bouillon article.

DETAILED DESCRIPTION OF THE INVENTION

The disclosed shaped bouillon article is singular in its exceptional hardness coupled with its rapid dissolution in water. In achieving such diverse performance characteristics, the inventive shaped bouillon article disdains encapsulating ingredients in fat or other lipoidal material that often is used to achieve bouillon product integrity. Instead, the inventive shaped bouillon article relies on bouillon indigenous ingredients to achieve product integrity. That is, the invention relies on ingredients that provide a known function in the bouillon art to achieve the desired bouillon function (*e.g.*, bulking, flavoring, *etc.*), while achieving product integrity, by merely hydrating the bouillon ingredients to a target moisture content of between about 1.4% and 2.2% wet weight basis.

Thus, the inventive shaped bouillon article is made from bouillon-forming ingredients. For purposes of this application, "bouillon-forming ingredients" comprehends those ingredients that are known and used, or later discovered and used, in the art for forming shaped bouillon products. Typical bouillon formulations utilize ingredients selected from certain classes of ingredients that provide/exhibit certain desired characteristics to the shaped bouillon product in its shaped (*i.e.*, pressed) form, as well as in use, for example, in stews, soups,

stocks, *etc.* The prime ingredients, then, used in making the inventive shaped bouillon article comprise a salt, an effervescing agent (*e.g.*, baking soda), a flavoring agent, and a bulking agent comprising maltodextrin. The classification of some ingredients may vary from manufacturer to manufacturer, because many ingredients provide more than one function in the inventive shaped bouillon product. It is only important that the ingredients used produce a bouillon article having the characteristics and function expected of conventional bouillon products.

Referring initially to the salts, typical salts used in the manufacture of bouillon products are sodium chloride and potassium chloride. Effervescing agents assist with dissolution of the bouillon article in (hot) water. Chief among effervescing agents used in this field is baking soda (sodium bicarbonate). Other suitable effervescing agents include, for example, sodium carbonate, potassium carbonate, potassium bicarbonate, and the like, and mixtures thereof. Effervescing agents typically are employed in the 4% to 9% by weight range in bouillon products.

Bulking agents also are common in bouillon products with maltodextrin being used in the inventive bouillon article. Maltodextrin performs the expected bulking function, but also assists in bonding the other ingredients together to provide product integrity. Other bulking agents include, for example, sugars and starches.

Flavoring agents include, for example, natural and artificial flavorings, spices, flavor enhancers, seasonings, hydrolyzed vegetable proteins, dried meats (*e.g.*, dried chicken or beef), chicken or beef fat, hydrogenated chicken and vegetable fats (*e.g.*, triglycerides, diglycerides, and monoglycerides), emulsions (*e.g.*, containing cooked chicken meat, chicken fat, diacetyl, and antioxidants), yeasts, and the like, and mixtures thereof. Though not necessarily flavoring in nature, food dyes and colorants can be included in this class of materials.

Optionally, flow agents or anti-caking agents are used in the bouillon formulation. Exemplary flow agents include, for example, calcium silicate and silicon dioxide. Such anti-caking agents, however, are added at a later step of the process, as will be described below.

Various other ingredients can be added to the shaped bouillon formulation for achieving special effects, added flavor, added color, added robustness, added rheology control, and the like, and still such formulations be within the ambit of the present invention. Of importance, however, is that the inventive shaped

bouillon article does not include, nor rely upon, fat coated ingredients in order to achieve product integrity and hardness, nor does it rely upon added binders, matrix polymers or resins, protective fat/oil coatings, water-repellent binding agents, or the like. Rather, by judicious selection of ingredients (*e.g.*, maltodextrin bulking agent), product integrity and hardness can be achieved.

The bouillon precursor particulate mixture can be made form dry ingredients or from wet ingredients (*e.g.*, chicken or beef emulsions). If the precursor is made from dry ingredients (*i.e.*, a moisture content of less than about 1.4% to 2.2% wet weight basis, then simply mixing of the ingredients can be accomplished in a food grade mixer. If however, the precursor has a moisture content of above about 1.4% to 2.2%, then it needs to be dried to a moisture content (wet weight basis) of less than about 1.4% to 2.2%. This is necessary so that the precursor can be hydrated in a later step of the process. Again, however, the "wet" ingredients formulation also is mixed in a food grade mixer.

After the ingredients have been mixed and dried, if necessary, then the dry or dried precursor mixture is blended while water is added. Preferably, the water is added by spraying an aqueous liquid on the mixing precursor mixture. A fine mist is preferred, say a mist having droplet sizes below about 400 μ. Sufficient water in the aqueous spray is incorporated into the precursor mixture to provide a final water content of between about 1.4% and 2.2% water on a wet weight basis. The aqueous spray can contain additives, if desired, such as dissolved flavoring agents, colorants, or the like, but preferably just food-grade pure water is employed.

At this stage of the process, any anti-caking agents in the bouillon formulation should be added to the hydrated mixture. The mixture then can be sent to a conventional cubing or tabletting operation wherein the mixture is pressed into the final product shape, *e.g.*, cubes. Typical densities of the shaped bouillon article will be below about 24.5 g/in^3, although this number is not at all critical. Of importance, however, is that a shaped bouillon article having exceptional hardness (greater than about 6.5 kg by the rod punch method) coupled with rapid dissolution in hot (~93° C) water (less than about one minute) has been achieved.

While the invention has been described with reference to certain advantageous embodiments, those skilled in the art will understand that various changes may be made and equivalents may be substituted for elements thereof without departing from the scope of the invention. In addition, many

modifications may be made to adapt a particular situation or material to the teachings of the invention without departing from the essential scope thereof. Therefore, it is intended that the invention not be limited to the particular embodiment disclosed as the best mode contemplated for carrying out this invention, but that the invention will include all embodiments falling within the scope of the appended claims. In this application most units are in the metric system and all amounts and percentages are by weight, unless otherwise expressly indicated. Also, all citations referred herein are expressly incorporated herein by reference.

EXAMPLES

EXAMPLE 1

Manufacturing Procedures of Fast-Dissolving Chicken Bouillon Cubes

The initial step in the manufacture of fast-dissolving chicken bouillon cubes involved the preparation of a precursor mixture as follows:

1. In a dry blender (*e.g.*, ribbon, Hobart, plow, paddle, or tumbling): add salt (45%-55% by weight), maltodextrin (15%-30% by weight), sodium bicarbonate (4%-9% by weight), spices (2%-5% by weight), color (0.2%-0.4% by weight), and flavors (10%-30% by weight). Commence blending the mixture for a 3-5 min.
2. Spray water (0.1%-0.5% by weight) while blending to hydrate the mix.
3. After water spraying is completed, blend for an additional 3-5 min.
4. Add anti-caking agent (such as silicon dioxide, 0.3%-1.0% by weight) and blend for 5 min.
5. Collect product in drums or totes.
6. The final moisture content of this precursor mixture is in the range of about 1.9%-2.2% (wet weight basis) using the vacuum oven method (5 hr at 100° C).

Using a commercial cube press, the final product was formed as cubes having the following properties:

- weight of 3.9 to 4.1 g (average of 4.05 g),
- size of 0.55-0.56" per cube side,
- average density of 23.08 g/in^3,
- average hardness (rod punch method) of 10.4 kg ("hardness" is defined as the force needed to punch a rod through a cube, and was measured using a Texture Technologies Corporation (Scarsdale, NY) Texture Analyzer, Model TA-XT2I; load cell: 50 kg, having a rod of about 1.5 mm in diameter), and
- average dissolution (in hot water) of 42 sec.

The final cube bouillon product then may be filled into glass jars (*e.g.*, 15 and 25 cubes/jar).

EXAMPLE 2

Manufacturing Procedures of Fast-Dissolving Chicken Bouillon Cubes

Using a Day mixer, the following ingredients were continuously mixed: salt (45% to 52% by weight), pre-blended dry bouillon (36% to 40% by weight), and chicken emulsion (10% to 20% by weight). The pre-blended dry bouillon was composed of sugar (26%-35%), maltodextrin (20%-30%), salts (8%-15%), and spices (25%-45%), and was made by the procedure described in Example 1. The mixture was dried at 210° F for 25 min, to a final moisture content of 0.7%-1.0 % (wet weight basis) using the vacuum oven method (5 hr at 100° C).

Next, the dried product was ground and classified into a "fines" lot (granules smaller than 1.7 mm using United States Sieves Series, # 12 mesh) and a "coarse" lot (1.70 mm < "coarse" < 4.75 mm). Thereafter, the following procedure was followed:

1. In a dry blender (*e.g.*, ribbon, Hobart, plow, paddle, or tumbling), the "fines" (75%-90% by weight) were blended for 6 min with sodium bicarbonate (5%-9% by weight) and salt (2%-6% by weight), the balance being dry spices and flavored salts and powders for the added desired taste. During the blending, water (0.4% to 0.7% by weight) was sprayed on the mixture to hydrate the mix.
2. After the water spraying was completed, the mixture was blended for an additional 5 min.

3. An anti-caking agent, such as silicon dioxide (0.3%-1.0% by weight) was added; and the blending continued for an additional 5 min.
4. The final mixture was collected and filled into drums or totes.

The final moisture content of the precursor is in the range of about 1.4%-1.8% (wet weight basis) using the vacuum oven method (5 hr at 100° C).

Using a commercial cube press, the final product was formed as cubes having the following properties:

- average weight of 4.2 g,
- cube size per side of 0.55"-0.56",
- average density of 24.4 g/in^3,
- average hardness (rod punch method, see Example 1) of 6.9 kg, and
- average dissolution (in hot water) of 48 sec.

The final cube bouillon product then may be filled into glass jars (*e.g.*, 15 and 25 cubes/jar).

EXAMPLE 3

Manufacturing Procedures of Fast-Dissolving Chicken Bouillon Cubes

The method of Example 2 may be carried out by simply using all the components from the milling process having a granule size less than 4.75 mm. Cube preparation procedures and characteristics are very similar to those detailed in Example 2.

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. Method for making a shaped bouillon article, which comprises the steps of:

(a) forming a bouillon precursor particulate mixture from bouillon-forming ingredients, which include maltodextrin;

(b) blending said mixture while adding water to achieve a target moisture content of between about 1.4% and 2.2% on a wet weight basis;

(c) optionally adding an anti-caking agent to said blend; and

(d) forming said hydrated blend into shaped articles having a hardness of at least about 6.5 kg (rod punch method) and a dissolution time in 93° C water of less than about one minute.

2. Method of claim 1, wherein said anti-caking agent is added to said blend in step (c).

3. Method of claim 1, wherein said bouillon-forming ingredients comprise a salt, an effervescing agent, a flavoring agent, and a bulking agent comprising maltodextrin

4. Method of claim 3, wherein said salt is one or more of sodium chloride or potassium chloride.

5. Method of claim 3, wherein said effervescing agent is one or more of sodium bicarbonate, sodium carbonate, potassium carbonate, or potassium bicarbonate.

6. Method of claim 3, wherein said bulking agent comprises maltodextrin and one or more of a sugar or a starch.

7. Method of claim 3, wherein said flavoring agent is one or more of natural and artificial flavorings, spices, flavor enhancers, seasonings, hydrolyzed vegetable proteins, dried meats, and vegetable triglycerides, vegetable diglycerides, vegetable monoglycerides, cooked meat emulsions, antioxidants, yeasts, food dyes, or colorants.

8. Method of claim 2, wherein said anti-caking agent is one or more of calcium silicate or silicon dioxide.

9. Method of claim 1, wherein said bouillon precursor particulate mixture formed in step (a) has a moisture content of above 2.2% and is dried to a moisture content of less than between about 1.4% and 2.2% on a wet weight basis prior to said blending step (b).

10. Method of claim 1, wherein said water is added in blending step (b) by spraying an aqueous liquid on said mixture while it is being mixed.

11. Method of claim 10, wherein said aqueous liquid spray is a mist having droplet sizes below about 400 μ.

12. Method of claim 1, wherein said hydrated blend is formed into shaped articles in step (d) having a density of below about 24.5 g/in^3.

13. Method for making a shaped bouillon article, which comprises the steps of:

(a) forming a bouillon precursor particulate mixture comprising a salt, an effervescing agent, a flavoring agent, and a bulking agent comprising maltodextrin;

(b) blending said mixture while adding water to achieve a target moisture content of between about 1.4% and 2.2% on a wet weight basis;

(c) adding an anti-caking agent to said blend; and

(d) forming said hydrated blend into shaped articles having a hardness of at least about 6.5 kg (rod punch method) and a dissolution time in 93° C water of less than about one minute.

14. Method of claim 13, wherein said salt is one or more of sodium chloride or potassium chloride.

15. Method of claim 13, wherein said effervescing agent is one or more of sodium bicarbonate, sodium carbonate, potassium carbonate, or potassium bicarbonate.

16. Method of claim 13, wherein said bulking agent comprises maltodextrin and one or more of a sugar or a starch.

17. Method of claim 13, wherein said flavoring agent is one or more of natural and artificial flavorings, spices, flavor enhancers, seasonings, hydrolyzed vegetable proteins, dried meats, and vegetable triglycerides, vegetable diglycerides, vegetable monoglycerides, cooked meat emulsions, antioxidants, yeasts, food dyes, or colorants.

18. Method of claim 13, wherein said anti-caking agent is one or more of calcium silicate or silicon dioxide.

19. Method of claim 13, wherein said bouillon precursor particulate mixture formed in step (a) has a moisture content of above 2.2% and is dried to a moisture content of less than between about 1.4% and 2.2% on a wet weight basis prior to said blending step (b).

20. Method of claim 13, wherein said water is added in blending step (b) by spraying an aqueous liquid on said mixture while it is being mixed.

21. Method of claim 20, wherein said aqueous liquid spray is a mist having droplet sizes below about 400 μ.

22. Method of claim 13, wherein said hydrated blend is formed into shaped articles in step (d) having a density of below about 24.5 g/in^3.

23. Method of claim 9, wherein said water is added in blending step (b) by spraying an aqueous liquid on said mixture while it is being mixed.

24. A shaped bouillon article having a target moisture content of between about 1.4% and 2.2% on a wet weight basis, a hardness of at least about 6.5 kg (rod punch method), and a dissolution time in 93° C water of less than about one minute and made from bouillon-forming ingredients comprising a salt, an effervescing agent, a flavoring agent, and a bulking agent comprising maltodextrin, wherein said bouillon-forming ingredients were hydrated to said target moisture content and an optional anti-caking agent added thereto for forming a blend, which blend was formed into said shaped bouillon article.

25. The shaped bouillon article of claim 24, wherein said anti-caking agent is added to form said blend.

26. The shaped bouillon article of claim 24, wherein said salt is one or more of sodium chloride or potassium chloride.

27. The shaped bouillon article of claim 24, wherein said effervescing agent is one or more of sodium bicarbonate, sodium carbonate, potassium carbonate, or potassium bicarbonate.

28. The shaped bouillon article of claim 24, wherein said bulking agent comprises maltodextrin and one or more of a sugar or a starch.

29. The shaped bouillon article of claim 24, wherein said flavoring agent is one or more of natural and artificial flavorings, spices, flavor enhancers, seasonings, hydrolyzed vegetable proteins, dried meats, and vegetable triglycerides, vegetable diglycerides, vegetable monoglycerides, cooked meat emulsions, antioxidants, yeasts, food dyes, or colorants.

30. The shaped bouillon article of claim 25, wherein said anti-caking agent is one or more of calcium silicate or silicon dioxide.

31. The shaped bouillon article of claim 24, which has a density of below about 24.5 g/in^3.

32. The shaped bouillon article of claim 25, wherein said salt is one or more of sodium chloride or potassium chloride; said effervescing agent is one or more of sodium bicarbonate, sodium carbonate, potassium carbonate, or potassium bicarbonate; said bulking agent comprises maltodextrin and one or more of a sugar or a starch; said flavoring agent is one or more of natural and artificial flavorings, spices, flavor enhancers, seasonings, hydrolyzed vegetable proteins, dried meats, and vegetable triglycerides, vegetable diglycerides, vegetable monoglycerides, cooked meat emulsions, antioxidants, yeasts, food dyes, or colorants; and said anti-caking agent is one or more of calcium silicate or silicon dioxide.