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Non-gluten noodels

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ABSTRACT

Process for the manufacture of non-gluten noodles by lamination comprising the steps of premixing 5 to 15 % of
5 gelatinized modified starch, 10 to 40 % of native starch and 10 to 40 % of non-gluten flour, adding 20 to 40 % of water containing 0.2 to 2.0 % of propylene glycol alginate and 0.2 to 2.0 % of at least one emulsifier and knead for a sufficient time to obtain a dough, laminating the dough
10 into sheet and shaping the dough sheet into noodles. Such non-gluten noodles made according the present process can be cooked and fried without cracking, crumbling or collapsing.

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COMPLETE SPECIFICATION

FOR A STANDARD PATENT

ORIGINAL

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Invention Title: 'NON-GLUTEN NOODLES'

The following statement is a full description of this invention, including the best method of performing it known to us:-

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NON-GLUTEN NOODLES

The present invention is concerned with non-gluten noodles and process for making such noodles.

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Traditionally, noodles are prepared by mixing wheat flour or semolina with water, kneading the mixture, laminating the obtained dough to a thickness of about 0.5 to 4 mm and then slitting into strips or ribbons the laminated sheets of dough. Then, the noodles can be steam-cooked or boiled and finally dried or fried. The use of wheat, due to its high protein/gluten content allows the laminating step. Indeed, the laminating step gives to the noodles a good texture, especially firmness.

15 Noodles can be produced by extruding then slitting of the dough instead of laminating. Such a process is quicker, due to the partial gelatinization of the starch on extruding, but the texture is less firm and the noodles risk to collapse during cooking. Further, the extrusion process is applied to non gluten-based noodles production such as rice noodles because it is impossible to laminate such non gluten-based dough due to the lack of binding properties. Gluten gives elasticity, texture and firmness to the dough that allows its lamination. Laminating non
20 gluten-based doughs gives unsatisfactory results ; the dough cannot be stretched, goes on cracking, does not keep its integrity. Further, frying of rice-based noodles is very difficult because of the cracking and crumbling of the noodles upon frying due to the lack of cohesive network.

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30 Thus, one needs a process line for wheat noodles using a laminating step and another process line for non-gluten

noodles, such as rice noodles, for example, including an extrusion step. This leads to increased production costs.

5 So, there is a need for a process for producing non gluten-based noodles by lamination technology.

To this end, the process for the manufacture of non gluten noodles according to the invention comprises the following steps :

10 - premix 5 to 15 % of gelatinized modified starch, 10 to 40 % of native starch and 10 to 40 % of non-gluten flour,

15 - add 20 to 40 % of water containing 0.2 to 2.0 % of propylene glycol alginate and 0.2 to 2.0 % of at least one emulsifier and knead for a sufficient time to obtain a dough,

- laminate the dough into a sheet,

- shape the dough sheet into the noodle,

20 In the case of oriental noodles manufacturing, 1-3 mm wide strips or noodles may be treated with steam, shaped into coils or nests and dried, especially with hot air or fried by deep-frying for example.

25 In the present text, the term "noodles" used as such denotes in the general sense any pasta or noodle having the shape of a relatively thin band with a section which is generally rectangular or curved in the form of a semi-tube.

30 We have found that by laminating the non-gluten based dough according to the invention, we can obtain noodles having greater strength and a better eating quality than noodles formed directly by extrusion of the dough. In addition, the lamination of the dough is possible on a laminating line without any crumbling of the dough. The

latter can thus be easily stretched and laminated to the desired thickness.

As regards the advantages of the present process, it was noted above that, surprisingly, it indeed makes it possible to manufacture non-gluten noodles having process-ability and organoleptic qualities completely comparable to those of wheat noodles manufactured by a traditional lamination process and apparatus.

The use of the three main ingredients of the dough allows texture and non-stickiness for an easy lamination.

The amount of gelatinized modified starch in the premix is from 5 to 15 %, the amount of native starch is from 10 to 40 % and the amount of non gluten-containing flour is from 10 to 40 %. These three main ingredients may be premixed in order to obtain homogeneous mix of these powdered ingredients. 20 to 40 % of an aqueous solution comprising 0.2 to 2.0 % of propylene glycol alginate and 0.2 to 2.0 % of at least an emulsifier is added to the powdered premix. This mix may then be kneaded for from 2 to 20 minutes for complete absorption of the water in order to obtain a dough.

The gelatinized modified starch used in the premix may be a pre-gelatinised hydroxypropylated diphosphate starch from potato, casava, maize or rice, for example.

The native starch may come from rice, maize, corn, tapioca or casava, for example. The emulsifier may be distilled monoglycerides, for example.

The non-gluten flour may be rice flour, maize flour, potato flour, soya flour or any kind of non-gluten or low gluten flour. As non-gluten or low gluten-containing flour it should be understood a flour whose gluten content is too low to permit the fabrication of noodles by lamination of a

dough without the drawbacks of cracking, crumbling, lack of cohesiveness and lack of elasticity. For example, a flour containing less than about 6 to 8 % of gluten or gluten-like proteins maybe considered as non-gluten or low-gluten flour.

5 The lamination of the dough may be easily achieved thanks one or few passages through a Fuji® lamination device until obtaining a thickness from about 0.5 to about 1 mm.

10 The sheets of dough obtained may then have a uniform thickness of about 0.5 to 1 mm, without crumbling or cracking.

The advantage of the process according to the present invention is that non-gluten dough can be processed in the same manner as wheat dough. Indeed, non-gluten dough cannot be laminated due to lack of binding properties. According to the present process, the presence of pre-cooked starch combined with propylene alginate provides the necessary binding for sheeting by lamination instead of extrusion.

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20 Thus, since the dough can be laminated and need not be extruded it may be processed on any wheat noodle fabrication line, such lines being less expensive than extrusion ones.

Further, due to the good binding, improved texture and non-stickiness, thanks to the ingredients and to the process, the noodles produced according to the present invention can easily be fried without cracking or crumbling. Thus in order to obtain good fried noodles with non-gluten material, the noodles made by the process according to the invention may be deep-fried after a cooking step.

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Once the dough has been laminated and slitted into noodles, the latter may be steam-cooked or boiled in order to gelatinize the starch of the dough. Preferably, the noodles are pre-cooked by steam-treatment. To carry out
5 this steam treatment and then forming into a nest, each strip or noodle may be converted to a continuous stream of transverse loops by causing it to hit a suitable brake. These streams may be treated with steam at atmospheric pressure at 95-100°C for 1-5 min and they can be cut
10 transversely into pieces whose length is equal to twice their width. The pieces can then be folded into two so as to obtain a square coil of noodles.

In the case of deep-frying, each coil may be placed in a square-shaped tub which is immersed in an oil bath heated
15 to the desired temperatures, this oil being preferably an oil resistant to heat, especially palm or groundnut oil for example.

The coils may then be cooled with cold air, especially with the aid of a stream or blast of cold air sufficiently
20 strong to detach and carry, in the form of droplets, at least a portion of the oil remaining on the surface of the fried noodles.

The deep-frying may also be preceded by a brief immersion of the coils in cold water, especially for 1-5 s,
25 in order to avoid possible problems of sticking of the noodles.

Before the cooking step, the noodles may be contacted with flavourings by dipping/showering in/with a flavouring solution, for example.

30 The fried noodles obtained by the process according to the invention may contain from 15 to 25% fat and from 3 to 9% moisture. Finally, according to the process of the

present invention, one can prepare high quality fried noodles using cheap flours such as rice or potato flour, for example. That means, one can obtain fried rice or potato noodles which have as good organoleptic properties as fried wheat noodles.

5 Of course, the cooked nests of noodles may also be hot air dried instead of being fried. Such drying may be carried out in a hot air dryer at a temperature of 90° to 120°C, preferably from 95 to 110°C for from 15 to 45
10 minutes. After hot air drying, the noodles have a moisture content of from 3 to 12%.

The fried or dried noodles thus obtained can either be eaten as such as an appetiser or as a snack but can also be cooked. Thus, for consumers who want to enjoy fried
15 noodles, they can just soak them in boiling water or cook them in boiling water, then drain off the water and toss them with a taste maker in order to obtain a dish of cooked fried noodles, for example.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:-

1. Process for the manufacture of non gluten noodles comprising the following steps :

5 - premix 5 to 15 % of gelatinized modified starch, 10 to 40 % of native starch and 10 to 40 % of non gluten-containing flour,

 - add 20 to 40 % of water containing 0.2 to 2% of propylene glycol alginate and 0.2 to 2 % of at least one
10 emulsifier and knead to obtain a dough,

 - laminate the dough into a sheet,

 - slit the dough sheet into the noodles.

15 2. Process according to claim 1 in which the noodles are cooked.

3. Process according to claim 2 in which the noodles are steam-cooked or boiled.

20 4. Process according to claims 2 and 3 in which the noodles are dried or deep-fried.

5. Process according claims 2 to 4 in which the noodles are contacted with a flavouring before the cooking step.

25 6. A process for the manufacture of non gluten noodles substantially as herein described with reference to any one of the embodiments of the invention illustrated in the accompanying examples.

DATED this 22nd Day of October, 2001

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