

ALIEN PROPERTY CUSTODIAN

PROCESS FOR THE MANUFACTURE OF AN IMPROVING AGENT FOR THE BAKING QUALITY OF FLOUR

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The present invention relates to a process for the manufacture of an agent for improving the baking quality of flour, and consisting more particularly of ascorbic acid in admixture with substances having an activating influence on the action of the ascorbic acid. Substances may also be incorporated to obtain more stable mixtures which are suitable for addition to flour and other meal and milling products by means of mechanical apparatuses.

The action on the baking properties of flour and meal and milling products of ascorbic acid or of compounds containing the ascorbic acid radical or of compounds from which ascorbic acid is readily formed, is described in the United States Patent Specification No. 2,149,682. In this specification it is also set out that very small quantities of ascorbic acid are usually sufficient for the desired action so that for example quantities of the order of 0.0002-0.0005% by weight of the flour are suitable. Furthermore it is at present generally accepted that ascorbic acid and vitamin C are identical.

In the United States Patent Application No. 164,989 methods are described for making stable mixtures comprising ascorbic acid by mixing it with solid sub-divided non-hygroscopic substances. In this way mixtures may be obtained which are stable to moisture and to oxidation.

Now it has been found that the improving action on the baking strength of flour of ascorbic acid, the compounds containing the ascorbic acid radical, and the compounds from which ascorbic acid is readily formed, may be increased by adding to these substances a very small quantity of an activator, which may possibly be regarded as a catalyst. As substances capable of activating or catalyzing the action of ascorbic acid mention may first be made of very small quantities of finely divided heavy metals or their compounds, such as copper, manganese, cobalt and iron, and further especially copper-, manganese-, cobalt- and iron proteins or proteic acid salts of copper, manganese, cobalt and iron, which may be obtained both from natural sources and synthetically. The common salts of the above mentioned heavy metals may be used advantageously because they are easily brought into a finely divided state. Selfevidently, mixtures of the activating agents can be used. Also it has been found that dried powder derived from several vegetables and fruits such as "Hubbard Squash" (*Cucurbita maxima*), Klentang (*Moringa pterygosperma*), cucumbers, cabbage leaves and tomatoes, may be used according to the invention. The above mentioned

activating catalysts are added to ascorbic acid in a quantity depending on their nature and on the desired action on ascorbic acid. The pure activating catalyst is added in a smaller quantity of e. g. 0.000001-10% by weight than the natural fruit powders containing this catalyst. They are preferably added in an amount such as occurs in natural sources of vitamin-C so that a mixture may be obtained in which the proportion of the activating agent to vitamin-C is approximately equal to that occurring in these natural sources of ascorbic acid.

By adding the activating substances as identified above, the amount of ascorbic acid required for a given improvement of the baking strength of flour is about half the quantity of ascorbic acid required if used alone, so a considerable saving of the improving agent may be obtained.

It is self-evident that according to the present invention an improved baking quality of the flour may also be obtained by mixing first the ascorbic acid with the flour or the dough prepared therefrom and thereafter adding a small quantity of the activating agent or by adding first the activating agent and thereafter the ascorbic acid to the flour. However, preferably the substances should be mixed intimately with the ascorbic acid, if desired in admixture with some indifferent substances according to United States Patent Application No. 164,989.

Also the invention includes the addition of activating agents to fruit juices or other vegetable preparations containing ascorbic acid if the quantity of the activating agents already present in such juices or preparations is not sufficient, and the application of such treated juices to baking. In this case it is not necessary to add the dried powder of the vegetables or fruits containing the activating substances to the preparations, which are relatively rich in ascorbic acid, but instead the juice pressed from vegetables and fruits may be employed.

The following specific examples may serve to illustrate methods of carrying out the invention in practice. It may be understood that these examples are not limitative.

Example I

A solution in water containing 1% by weight of gelatin is cooked with a small amount of copper hydroxide and is thereafter filtered, giving a solution of copper-proteinate having a copper content of about 25 mg./litre. This solution is thoroughly distributed over some starch in such a way that after drying a mixture is obtained which contains

0.01% of copper in active form. To 0.75 gr. of this mixture 0.75 gr. ascorbic acid and 98.5 gr. of maize starch are added and the whole is intimately mixed. This preparation has an active copper content of 0.000075%. These 100 grams of treating agent are added to 100 Kg. of flour and loaves are baked in the usual way from 450 gr. of flour per loaf. The volume of a loaf of untreated flour is 2310 ccs. whereas a loaf of untreated flour has a volume of 2635 ccs., which is an improvement in volume of 14%. The same flour treated with ascorbic acid in a quantity of 1.5 gr./100 Kg., i. e. double the amount used above, gives a bread of a volume of 2585 ccs., i. e. an improvement in volume of 11%.

Example II

The fruits of kelor (*moringa pterygosperma*) are dried in vacuum at low temperature after being comminuted. In this way a dry mass is obtained which may be converted to a finely divided dry powder. An improving agent for the baking quality of flour and other meal and milling products may be prepared by adding 5% of this fruit powder to 1% ascorbic acid, 30% wheat starch and 64% dicalcium phosphate. For the treatment of flour 60 grams of this powder are equivalent to 100 grams of the same agent without fruit powder, when added to 100 Kg. of flour.

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