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**PREPARATION OF A BAKING AGENT FOR USE IN
YEAST-LEAVENED PRODUCTS**
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10 Claims

ABSTRACT OF THE DISCLOSURE

A baking additive for use in making yeast-leavened products is prepared by heating a suspension of soy flour, liquid whey and/or liquid non-fat milk in the presence of calcium peroxide.

The present invention relates to an improved method of making yeast-leavened products and, more particularly, to a novel baking addition agent, to be used therein.

Heretofore, those skilled in the art know that in the practice of making bread and related leavened products, two systems have generally been employed. One is the multiple stage sponge method and the other is the continuous dough making system. It has long been known in the art that non-fat dry milk seriously affects the volume, symmetry, cellular structure, and texture of bread when used as such. Research by prior investigators has found that such non-fat milk, when heat treated by holding it at about 180° F. to about 190° F. over a period of time, overcomes this undesirable property to a certain degree when it is used in the conventional system of bread making. However, when used in the continuous system, the baker has found that he cannot go much above 2% on the weight of flour as against 6% in the conventional method. This serious short-coming, together with the high price of non-fat dry milk, has brought into use dry, heat-treated, non-fat soy flour alone or in combination with heat-treated, dry whey and, in some cases, with non-fat dry milk. While these prior products were used alone or in combination, the prior products were still not sufficiently stable, even though the baker used a somewhat increased quantity of potassium bromate and potassium iodate alone or in combination. This was especially true when he used the continuous system. The baker was limited in the quantitative use of these prior oxidizing agents to seventy parts per million per hundred weight of flour, as defined by the Food and Drug Administration "Standards of Identity for White Bread and Rolls." Although many attempts were made to overcome the foregoing shortcomings and other disadvantages, none, as far as I am aware, was entirely successful when carried into practice commercially on an industrial scale.

It has now been discovered by my research that it is possible to use calcium peroxide to overcome the undesirable baking characteristics of non-fat milk, whey, and soy flour alone or in combination.

It is an object of the present invention to provide an improved method of making yeast-leavened products.

Another object of the invention is to provide a novel addition agent for use in the making of baked goods, such as bread and rolls.

The invention also contemplates the incorporation of a novel whey-soy concentrate in yeast-leavened dough for baking into bread and rolls.

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It is a further object of the invention to provide for the treatment of milk and milk derivatives in liquid form by calcium peroxide alone or in combination with hydrogen peroxide.

The invention further contemplates providing an oxidation treatment of milk and milk derivatives in liquid form by calcium peroxide in the presence of an organic acid, such as lactic acid.

It is another object of the invention to provide an oxidation treatment for defatted soy flour in water suspension in the presence of calcium peroxide by heating at a near boiling temperature for a period of time.

Among the further objects of the present invention is the provision of an oxidation treatment of whey, non-fat milk and defatted soy flour suspended in liquid by calcium peroxide in the presence of lactic acid or similar organic acid and by heating to near boiling temperature for a short period of time of less than one hour.

Other objects and advantages will become apparent from the following description.

I have found that non-fat milk, whey, and/or soy flour can be subjected to oxidation by calcium peroxide in accordance with my procedure and can produce a novel baking addition agent. It is preferred to make a slurry composed of liquid whey, soy flour (defatted), and calcium peroxide according to the following formula:

Ingredient:	Amount, pounds
Liquid whey -----	1,000
Soy flour (defatted) -----	70
Calcium peroxide -----	.75-1

However, calcium peroxide may be used in a broad range of about 0.25 to 1.5. It is to be noted, however, that partially defatted soya flour, partially defatted milk, alone or in combination, may be used as well as non-fat milk. As those skilled in the art know, there are basically two types of whey: namely, (1) sweet whey derived from cheddar, Swiss, etc., and (2) acid whey derived from cottage cheese or other acid cheeses. When sweet whey is used, it is necessary to use lactic acid to react with the calcium peroxide and thus produce hydrogen peroxide. On the other hand, acid whey contains enough lactic acid to bring about the reaction involving calcium peroxide. The protein fraction obtained from soya flour and/or beans may also be added.

In carrying my procedure into practice, the liquid whey, soy flour, and calcium peroxide are thoroughly mixed to produce a slurry. This slurry can be fed into an appropriate apparatus, such as a conventional jacketed dairy tank well known in the art. The slurry is heated to about 180° F. for about 20 to about 30 minutes. Thereafter, the slurry is condensed down to a 25% to 30% solids content by using a dairy condensing system or other suitable method as well known by those skilled in the art. The condensed slurry is fed under agitation directly into an appropriate dryer. It is preferred to use a spray dryer, preferably of the rotating disc type. The Webb spray dry method may also be used where air, CO₂, or nitrogen are injected into the mass to be dried. As another alternative, a roller drying system may be used.

The whey-soy dried product produced in accordance with the foregoing procedure is preferably dried to about a 3% moisture level thereby producing a white powder-like material. Its composition, due in part to the high lactose content of the whey and the amino acid structure