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(54) **METHODS FOR PRODUCING COOKED SWEETPOTATO PRODUCTS AND COMPOSITIONS THEREOF**

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(57) **ABSTRACT**

Methods for producing cooked sweetpotato products suitable for freezing, baking or frying comprising adding to a cooked sweetpotato purée additional edible dry matter, tetrasodium pyrophosphate, a gelling agent and a calcium salt-water suspension sufficient to cause gelling, mixing the aforementioned ingredients together and forming the resulting mixture into desired shapes are disclosed. Structured sweetpotato food products comprising sweetpotato purée, added edible dry matter, tetrasodium pyrophosphate, alginate, added sucrose, added calcium and added water which can be frozen, baked or fried are also disclosed.

**3 Claims, No Drawings**

# METHODS FOR PRODUCING COOKED SWEETPOTATO PRODUCTS AND COMPOSITIONS THEREOF

## FIELD OF THE INVENTION

The present invention relates to a method for producing cooked sweetpotato products suitable for freezing, baking or frying. These convenience sweetpotato products have good flavor and textural properties, and can have lower fat when compared to commercial fried products from Irish potato.

## BACKGROUND OF THE INVENTION

The sweetpotato (*Ipomaea batata*) is an economical and healthful food crop that contains high beta-carotene and substantial amounts of ascorbic acid and minerals. Yet, only a limited amount of sweetpotato production is utilized for processing into canned roots, canned puree, patties, and baby foods. At present, the main market form of sweetpotatoes is fresh roots for home cooking, which usually required considerable preparation time. Moreover, the quality of cooked sweetpotatoes can vary due to varietal differences, growing conditions, and postharvest handling practices. These facts pose a serious problems to the sweetpotato industry, which has been declining.

In order to fully exploit the potential of sweetpotatoes, development of new food products that require minimal home preparation and meet the preferences of today's consumers is, therefore, necessary. With the availability of food ingredients possessing various functionalities, convenience products from meat (G. R. Schmidt and W. J. Means, 1986, U.S. Pat. No. 4,603,054), fruits (K. Hannigan in Food Engineering, 1983, 55:48) and Irish potatoes (J. E. Citti and C. S. Dienst, 1980, U.S. Pat. No. 4,198,437) have been developed. M. A. Padula (1987) disclosed a method for producing structured potato french fries, string or has browns using alginate. Products made with alginate, which require the addition of calcium ions to trigger gelling, can often have a bitter taste that limits the products' acceptance by consumers.

Until now, advances in food ingredient technology have not been applied to sweetpotatoes. Sweetpotatoes are well suited for use in more types of structured products than any other high beta-carotene vegetables. It would be particularly desirable to use sweetpotatoes as a substitute for the extremely popular American french fry product made from Idaho potatoes. There is an unmet need for healthful, tasty products made from sweetpotatoes.

## SUMMARY OF THE INVENTION

In accordance with the present invention, there are provided methods for producing a cooked sweetpotato product suitable for freezing, baking and frying, comprising: (a) adding to cooked, peeled and puréed sweet potato roots additional edible dry matter to bring the dry matter content to at least approximately 25%, tetrasodium pyrophosphate (TSPP), a gelling agent, and a calcium salt-water suspension sufficient to cause felling; (b) mixing all the ingredients in (a) together; and (c) forming the resulting mixture into desired shapes and allowing them to gel. Also provided are structured sweetpotato food products comprising at least approximately 85% sweetpotato purée, at least approximately 5% added edible dry matter, approximately 0.2% TSPP, 0.3-0.7% alginate, at least approximately 4% added sucrose, 0.3-0.5% added calcium, and approximately 2-5% added water. Such structured sweetpotato products can be frozen, baked or fried.

# DETAILED DESCRIPTION OF THE INVENTION

## Definitions:

As used herein, the following terms have the meanings set forth below:

"A" or "an" can mean one or more, depending upon the context in which it is used.

"Batter", "coating", and "breading" are used interchangeably herein and refer to an edible material that can be coated onto food products prior to frying.

"Purée", "puréed", and "puréeing" mean sweetpotato roots that have been ground, mashed, chopped, blended, or otherwise treated such that the roots are in a form suitable for mixing with other materials.

## Detailed Description:

The present invention is useful for all cultivars of sweetpotato roots and for all sizes of roots. In a preferred embodiment, orange-fleshed sweetpotatoes are utilized. In specific embodiments, the cultivars named Jewel, Beauregard, and Hernandez are utilized. The methods allow the use of mixtures of roots from several sweetpotato cultivars to be processed together into a final product line.

Sweetpotato roots are first peeled according to methods well-known in the art. For example, roots can be "lye-peeled" by immersion in a boiling solution of sodium hydroxide, preferably a solution of 5.5%; for 4 minutes, then thoroughly washed in a rotary reel-sprayed washer to remove the skins and lye residue. Other peeling methods such as steaming and abrasion can also be used.

The sweetpotato roots are processed to allow gelatinization of the starch, through the activity of endogenous amylase enzymes which form maltose from the starch. The processing eventually results in the inactivation of these enzymes. Typically, this is accomplished by cooking. For example, peeled roots are diced or sliced and then steam-cooked for approximately 20 minutes in a thermascrew cooker (for example, a Reitz Thermascrew Cooker by Hosokawa Micron International, Inc., New York, N.Y.). Roots can be cooked whole using other cooking apparatus, but the cooking time will be longer.

The cooked sweetpotato roots should be processed to a consistency that is appropriate for mixing in ingredients specified in the methods of this invention. Such processing can be accomplished, for example, by chopping, blending, or mashing, resulting in a "purée" of sweetpotato roots that can be used in the methods of this invention. A typical method for creating a "purée" is to use a hammer mill (for example, a Fitzmill Model D Comminuting Machine; Fitzpatrick & Co., Chicago, Ill.) fitted with a 0.15 cm screen, through which is pushed the cooked and peeled roots.

After processing sweetpotato roots into a purée, the dry matter content of the purée is adjusted to be at least approximately 25%, as calculated on a fresh weight basis. In a preferred embodiment, the dry matter content is adjusted to a value between 25% and 40%. The dry matter content is adjusted by adding one or more edible materials selected from the group consisting of: potato flakes, sweet potato flakes, wheat flour and starch. In a preferred embodiment, the dry matter content is between 25% and 35%. In a specific embodiment, the dry matter content is approximately 27%. Dry matter content is typically determined by taking a sample of the purée, determining its fresh weight, then drying the sample at 100° C. until a consistent, dry weight value is obtained. The dry weight value is typically expressed as a percentage of the wet weight value.

The dry matter content of sweetpotato puree prepared according to methods disclosed herein is typically a value