Method for preparing a potato product for finish-frying, processing line therefor and such a potato product for finish-frying

The present invention relates to a method for preparing a potato product for finish-frying, such as french fries or other forms of granulates or starch compositions. Such french fries as exemplary product relate particularly to french fries which can be or are deep-frozen and which are finish-fried at a later stage. In an alternative process the french fries are fresh fries which are finish-fried directly or from a refrigerator.

Potato products, in particular french fries, are produced and consumed in large quantities worldwide. These products are usually rich in (available) carbohydrates and fats and are also high-calory, i.e. have a high energy content/high energetic value. Consumption of large quantities can certainly contribute toward an unhealthy lifestyle of a consumer, which can result in medical and other problems.

The present invention has for its object to provide a method for preparing a potato product for finish-frying with which a potato product, in particular french fries, can be realized with preferably a relatively low content of (available) carbohydrates and preferably low fat content and a relatively low energetic value and which is also perceived by the consumer as being a tasty product of good quality in respect of, among other qualities, crunchiness, bite, mouthfeel, colour, flavour and the like.

This object is achieved with the method for preparing a potato product for finish-frying according to claim 1.

The method according to the invention prepares a potato product, in particular french fries, which is pre-fried and which is to be finish-fried. Other potato products which are finish-fried can however also be prepared with the same method. It is possible here to envisage other potato starch or granulate products. These products can be prepared with the method according to the present invention. The method will be elucidated in more detail hereinbelow with french fries as

modified starch and unmodified starch is of great importance here for the final result of the potato product after the finish-frying process. This result relates to, among other factors, the extent to which the interior, or filling, of the potato product is cooked and its texture and structure, the crispness/crunchiness of particularly the crust of the potato product, and the desired golden yellow colour of the finish-fried end product. The relation between crispness of the crust and the soft texture/structure of the filling is relevant here.

It has been found particularly that the use of the above described coating in the described method, preferably with potatoes of said varieties, results in a low-calory potato product according to claim 15 with the following properties following finish-frying thereof, preferably in an air fryer, of:

- calorific value lower than 190 kCal/100 g;
- content of available carbohydrates 20-24%;
- acrylamide lower than 100 µg/kg;
- colour in accordance with USDA ≤ 3;
- fat content in the range of 5-7%;
- texture 1.5-2.5 Newton; and
- shelf life of 5 minutes during holding time at about 60°C under a heating lamp.

The specific coating composition according to the invention has been found particularly suitable for use with (low-carbohydrate) potato varieties with a relatively low underwater weight equal to or lower than 300 g/5 kg as starting material for the potato product. Such low-carbohydrate potatoes, including for instance the potato varieties Colomba and Carrera, are usually used in practice for boiling and frying processes other than deep-frying. Deep-frying of potato products from these potato varieties results in a conventional frying process in (very) limp french fries with a very considerable brown discoloration and high content of acrylamide. It has been found that the coating in accordance with the composition according to the invention is extremely suitable for these low-carbohydrate potato varieties in particular and results in an end product, particularly french fries and optionally also other potato products, with the desired properties in respect of crispness, hardness, extent to which it is cooked, colour and the like. By using potato varieties with a low underwater weight in interaction with the coating with the composition according to the invention, whereby absorption of (deep-frying) oil is for instance counteracted, the end product is relatively low-calory and low-carbohydrate. It has been found that said aspects can be improved still further by being applied in combination with the air frying further elucidated in this description.

It is found that, by applying the coating with the composition according to the invention, a reduction in energy content (in kCal) of more than 20%, even more than 25%, and under certain conditions even about 50%, is possible compared to french fries as currently prepared by known fast-food restaurants. This means a significant reduction in energy content of the end product. A

Claims

1. Method for preparing a potato product for finish-frying, comprising the steps of:

- supplying a quantity of potatoes of a potato variety with an underwater weight equal to or lower than 300 g/5 kg;
- washing, peeling and cutting the supplied potatoes to form a basic potato product;
- blanching the basic potato product to form a blanched potato product;
- drying the blanched potato product;
- applying a coating to the blanched and dried potato product to form a coated potato product; and
- pre-frying the coated potato product to form a pre-fried potato product,

wherein the steps provide a potato product having a dry substance percentage after coating and pre-frying and before finish-frying in the range of 29.1 – 34.2%, and after finish-frying in the range of 38.7 – 45.4%, and wherein the energetic value is in the range of 100 – 120 kCal/100 g after coating and pre-frying and before finish-frying and is lower than 190 kCal/100 g after finish-frying.

2. Method as claimed in claim 1, further comprising the step of finish-frying the pre-fried potato product, wherein the energetic value of the finish-fried potato product is lower than 180 kCal/100 g, preferably lower than 170 kCal/100 g, more preferably lower than 160 kCal/100 g and most preferably lower than 150 kCal/100 g.

3. Method as claimed in claim 1 or 2, wherein the content of available carbohydrate in the finish-fried potato product is lower than 29% by weight, preferably lower than 28% by weight, more preferably lower than 26% by weight, still more preferably lower than 24% by weight and most preferably lower than 22% by weight, and/or wherein the acrylamide content in the potato product after pre-frying and before finish-frying is lower than 30 µg/kg.

4. Method as claimed in one or more of the foregoing claims, wherein the blanching time lies in the range of 8 to 12 minutes, preferably in the range of 9 to 11 minutes, and most preferably amounts to about 10 minutes, and/or wherein the blanching temperature lies in the range of 74 to 84°C, preferably lies in the range of 76 to 83°C and is most preferably in the range of 78 to 82°C, and/or wherein the temperature amounts to about 160°C during application of the coating which is applied within a time interval in the range of 1.5 to 2.5 minutes, and/or wherein the finish-frying time lies in the range of 6 to 9 minutes, preferably in the range of 7 to 8 minutes.

5. Method as claimed in one or more of the foregoing claims, wherein the coating is provided with a composition comprising by weight relative to the weight of the composition:

- 30-60% modified starch comprising high-amylose starch;
- 20-30% flour;
- 5-20% dextrin;
- 2-10% unmodified starch; and
- 0.01-2% carbonate,

wherein the modified starch preferably comprises 10-25% chemically acetylated starch of the content of modified starch.

6. Method as claimed in one or more of the foregoing claims, further comprising the step of modifying the coating composition on the basis of the origin of the potato product, storage life and/or storage conditions.

7. Method as claimed in one or more of the foregoing claims, wherein the pre-fried potato product is deep-frozen prior to the finish-frying, and/or wherein the finish-frying is performed with hot air in an air fryer, preferably at a frying temperature in the range of 160°C to 240°C, more preferably in the range of 170°C to 190°C and most preferably at about 180°C.

8. Method as claimed in one or more of the foregoing claims, wherein an end product is realized by performing finish-frying for about 8 minutes at above 180°C that gives a texture with a breaking value in the range of 1.5 to 3 N.

9. Method as claimed in one or more of the foregoing claims, further comprising the step of selecting a batch for the purpose of providing a low-calorie potato product for finish-frying, comprising of determining the dry substance content for a batch as a function of frying time, wherein a batch is preferably assessed as suitable if the directional coefficient for the relation between dry substance content and frying time lies in the range of 4-6% dry substance per minute of frying time at a frying temperature of 180°C.

10. Method as claimed in one or more of the foregoing claims, wherein the coating is applied with a suspension provided with a dry substance content in the range of 30-55%, preferably in the range of 35-45%.

11. Processing line configured to perform the method as claimed in one or more of the foregoing claims.

12. Potato product for finish-frying prepared with the method as claimed in one or more of the foregoing claims.

13. Potato product for finish-frying as claimed in claim 12, comprising a percentage by weight of the coating composition relative to the end product in the range of 5-18%, preferably 5-16%, more preferably 6-15%, still more preferably 11-15%, and most preferably 12-14%, obtained from a coating process.

14. Potato product for finish-frying as claimed in claim 12 or 13, wherein the starting material are potatoes of a potato variety with an underwater weight equal to or lower than 300 g/5 kg, preferably of the potato varieties Colomba, Carrera or Evora.

15. Application of the method as claimed in one or more of the claims 1-10, resulting in a potato product provided with a:

- calorific value lower than 190 kCal/100 g;
- content of available carbohydrates of 20-24%;
- acrylamide lower than 100 µg/kg;
- colour in accordance with USDA ≤ 3;
- fat content in the range of 5-7%;
- texture in the range of 1.5-2.5 Newton relating to the exerted force at which products break; and
- shelf life of 5 minutes in holding time period at about 60°C under a heating lamp.