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"A process for manufacturing food products for final preparation at the point of use or sale."

The invention relates to the manufacture of food products and in particular to the large scale manufacture of food portions for final preparation at the point of use or sale.

Frozen ready-meals are widely available. In general, the organoleptic properties of taste and mouth feel of such frozen meals is inferior to a meal cooked from the raw ingredients.

This invention is directed towards providing a process for preparing food products which will facilitate preparation of a range of high quality ready meals on a large scale without the considerable inconvenience of home preparation.

Statements of Invention

According the to the invention there is provided a process for preparing a food product comprising the steps of:-

providing an agitated cooking vessel having a capacity to produce a batch size of at least 300 litres;

introducing cooking oil or butter into the vessel;

heating the oil to a temperature of from 90°C to 95°C;

adding dry ingredients such as seasonings and herbs to the heated oil;

sweating the dry ingredients in the oil for a period of at least 3 minutes until the temperature of the oil is from 50 to 60°C;

adding cold water to the vessel in an amount of from 30 to 50 times the volume of cooking oil introduced into the vessel;

heating the water in the vessel to a temperature of at least 90°C;

preparing a roux comprising about 50% by weight vegetable oil and 50% flour;

adding the roux to the heated mixture in an amount of from 10% to 20% of the batch size;

adding additional fresh vegetables pieces to the thickened mixture in the vessel;

cooking the vegetables in the vessel over a vegetable cooking time;

intermittently adding water in a total amount of from 1% to 10% of the batch size during only the first 60% of the vegetable cooking time;

transferring the cooked mixture to a vacuum cooler;

cooling the mixture to a temperature of less than 5°C; and

packing the cooled mixture.

In one embodiment the process comprises the steps of:

adding fresh onion pieces to the sweated dry ingredients; and

sweating the mixture thus formed in the heated oil for at least a further 5 minutes.

The process may comprise adding additional roux during the intermittent water addition phase.

Additional natural ingredients such as cream or wine may be added at the same time as the roux.

In one embodiment the process includes the step of emulsifying the mixture in the vessel after addition of the dry ingredients. The mixture in the vessel after addition of the fresh onion pieces may also be emulsified. The mixture in the vessel after addition of the roux may also be emulsified. The mixture in the vessel after addition of the additional vegetables may also be emulsified.

Preferably the process comprises continuously agitating the mixture up to and including transfer to the cooler.

Preferably the mixture is also agitated during cooling.

In one embodiment there is a plurality of different additional vegetables which are added at different stages during cooking of the additional vegetables.

In one embodiment the process comprises cooling the mixture in the vessel prior to transfer to the cooler. The vessel may be a jacketed vessel, the vessel being heated

by circulation of steam through the jacket and being cooled by circulation of cold water through the jacket.

In one embodiment the cooled mixture is packed in a pouch. Additional ingredients are added to the cooled mixture. The additional ingredients may be meat or fish such as fish or meat pieces.

In one embodiment the additional ingredient pieces are prepared by:

adding seasoning to the additional ingredient pieces;

sealing the exposed surfaces of the ingredient pieces in a heated pan;

removing the sealed ingredient pieces from the heated pan;

placing the sealed ingredient pieces on a cooling rack; and

commencing blast chilling of the sealed ingredient pieces less than about 30 seconds after removal from the heated pan.

The ingredient pieces may be chicken pieces which are sealed at a pan temperature of about 320°C for a period of about 40 seconds.

The ingredient pieces may be red meat pieces which are sealed at a pan temperature of about 350°C for a period of about 30 seconds.

The ingredient pieces may be fish pieces which are sealed at a pan temperature of about 300°C for a period of from 25 to 40 seconds.

Detailed Description

In the invention a cooking vessel having a capacity to produce a batch size of at least 300 litres, usually up to 450 litres is used. The vessel is a jacketed and agitated stainless steel cooking vessel which also has an emulsifier fitted. The system used also comprises a vacuum cooler with a transfer pipe from the cooking vessel.

Oil or butter in an amount of about 2 kgs to 3 kgs is introduced into the cooking vessel. The oil is heated to a temperature of from 90°C to 95°C by circulating steam through the vessel jacket. Dry ingredients such as seasonings, herbs, and/or garlic are added to the heated oil. White wine may also be added. This addition causes the oil to cool and the dry ingredients are sweated in the oil for a period of at least 3 minutes, generally about 5 minutes, until the temperature of the oil is from 50°C to 60°C.

Prepared fresh onion pieces are then added to the sweated dry ingredients and the mixture thus formed is sweated for at least a further 5 minutes, generally about 10 minutes.

Cold water is added to the vessel in an amount of from 30 to 50 times the volume of cooking oil introduced into the vessel. The water is heated to a temperature of at least 90°C.

A roux comprising about 50% by weight vegetable oil and 50% plain wheat flour is prepared. The roux is added to the heated mixture in an amount of from 10% to 20% by weight of the batch size. An average of 30kg of roux is added. The range is between 25 and 40 kgs of roux, depending on the moisture content of the vegetables. Additional natural ingredients such as cream or sometimes wine may be added with the roux.

Fresh vegetables are prepared, for example, by cleaning, skin removal and cutting to size. The vegetable pieces are added to the thickened mixture in the vessel and the vegetables are cooked over a vegetable cooking time of typically 30 minutes. There may be a number of different vegetables added which may be introduced at different stages. For example, carrot pieces may be introduced first followed 10 minutes later by mushrooms and followed a further 10 minutes later by peppers.

Water is intermittently added to the mixture in a total amount of from 1% to 10% of the batch size during only the first 60% of the vegetable cooking time. This counteracts evaporation losses but without sacrificing quality and flavour. The amount of additional water added in this period is determined based on seasonality factors and vegetable moisture content. Additional roux may be added during this intermittent water addition phase.

During the sweating and cooking the contents of the vessel are continuously agitated. The mixture may also be emulsified for particle attrition at the dry ingredients addition stage, the onion addition stage, the roux addition stage and/or when additional vegetables are added.

After cooking, the contents of the vessel are transferred to a vacuum cooler in which the mixture is cooled to a temperature of less than 5°C. To optimise capacity usage cold water may be circulated through the jacket of the cooking vessel prior to transfer of the mixture to the vacuum cooler.

The cooled mixture is packaged in pouches of a suitable size for cooking/reheating by the customer. Further food pieces may be added to the pouch. Such food pieces may be white meat such as chicken pieces, red meat pieces or fish pieces. The additional food pieces are first seasoned and the exposed surfaces of the pieces are sealed in a heated pan. In the case of chicken pieces the pan is heated to about 320°C and the chicken pieces are sealed for about 40 seconds. In the case of red

meat pieces the pan is heated to about 350°C and sealed for about 30 seconds. In the case of fish pieces, the pan is heated to about 300°C and the fish pieces are sealed for about 25 to 40 seconds.

The sealed ingredient pieces are placed on a cooking rack and blast chilling of the sealed ingredient pieces is commenced about 30 seconds after removal from the heated pan.

The blast chilled meat pieces are added to the pouch.

Example

A batch of 350kg of chicken curry is prepared as follows.

3.5kgs of butter is added to the cooking vessel as described above. The butter is heated to a temperature of from 90 to 95°C. Dry ingredients comprising 4.343kg of mild curry paste, 10kg of chopped tomatoes, 0.280kg of cinnamon, 0.200kg of coriander, 0.140kg of Masala, 5.2kg of sugar, 0.608kg garlic puree and 5.2kg of chicken bullion are added to heated butter. The ingredients are sweated to a temperature of about 40°C for about 2 to 3 minutes.

- 160 litres of cold water are added to the cooking vessel and the mixture is heated

- 40kg of a roux comprising 50% vegetable oil and 50% cream flour is added to the water mixture. 1.107kgs of tumeric is added after the roux. The mixture is emulsified for about 20 minutes. 17kg of cream are added and the mixture is further emulsified for another 2-3minutes, maintaining the temperature at 90 to 95°C. 0.1919kg of salt and 0.069kg of pepper are than added.

Additional vegetable pieces are then added to the thickened mixture. 40kg of chopped carrots are added and cooking continues for 5-10 minutes. 30kg of mushrooms are then added and cooking is continued for 2-3minutes. At that stage 40kg of onions, 10kg of red peppers and 10kg of green peppers are added.

During the first 60% of the vegetable cooking time between 5 and 12kgs of water are added intermittently depending on the moisture content of the vegetables and the texture of the sauce. Cooking is continued for a further period of about 20 minutes.

The mixture thus prepared is transferred to the vacuum cooler where it is cooled to about 4°C prior to packing into appropriately sized pouches.

1kg whole chicken breast meat is sealed on a pan which is preheated to about 320°C. All sides of the chicken breast are sealed over a period of about 40 seconds. The sealed whole breast is then cut into cubes of about 20x20x20mm. The chicken pieces are laid on a pack and blast chilling commences not less than 30 seconds after removal from the pan.

The cooked chicken pieces are loaded into the pouches. The pouches are then sealed and the contents are frozen in a spiral freezer.

A range of high quality meals may be prepared in this way. The meals may be supplied frozen in vacuum-packed pouches. When defrosted, at the point of use/sale the meals may be proportioned into individual microwaveable trays. When required, the food may be heated in a microwave ready for immediate consumption. Alternatively, the food may be heated directly whilst still in the pouch, either in an oven or by immersing in hot water and boiling. A steam oven at 100°C or a convection oven at 150°C may be used. In the case of a convection oven a bowl of water may be added to create steam.

The invention is not limited to the embodiments hereinbefore described which may be varied in detail.

Claims

1. A process for preparing a food product comprising the steps of:-

providing an agitated cooking vessel having a capacity to produce a batch size of at least 300 litres;

introducing cooking oil or butter into the vessel;

heating the oil to a temperature of from 90°C to 95°C;

adding dry ingredients such as seasonings and herbs to the heated oil;

sweating the dry ingredients in the oil for a period of at least 3 minutes until the temperature of the oil is from 50 to 60°C;

adding cold water to the vessel in an amount of from 30 to 50 times the volume of cooking oil introduced into the vessel;

heating the water in the vessel to a temperature of at least 90°C;

preparing a roux comprising about 50% by weight vegetable oil and 50% flour;

adding the roux to the heated mixture in an amount of from 10% to 20% of the batch size;

adding additional fresh vegetables pieces to the thickened mixture in the vessel;

cooking the vegetables in the vessel over a vegetable cooking time;

intermittently adding water in a total amount of from 1% to 10% of the batch size during only the first 60% of the vegetable cooking time;

transferring the cooked mixture to a vacuum cooler;

cooling the mixture to a temperature of less than 5°C; and

packing the cooled mixture.

2. A method as claimed in claim 1 comprising the steps of:

adding fresh onion pieces to the sweated dry ingredients; and

sweating the mixture thus formed in the heated oil for at least a further 5 minutes.

3. A process as claimed in claim 1 or 2 comprising adding additional roux during the intermittent water addition phase.

4. A process as claimed in any of claims 1 to 3 wherein additional natural ingredients such as cream or wine are added at the same time as the roux.

5. A process as claimed in any preceding claim including the step of emulsifying the mixture in the vessel after addition of the dry ingredients.

6. A process as claimed in any preceding claim including the step of emulsifying the mixture in the vessel after addition of the fresh onion pieces.

7. A process as claimed in any preceding claim including the step of emulsifying the mixture in the vessel after addition of the roux.

8. A process as claimed in any preceding claim including the step of emulsifying the mixture in the vessel after addition of the additional vegetables.

9. A process as claimed in any preceding claim comprising continuously agitating the mixture up to and including transfer to the cooler.

10. A process as claimed in any preceding claim wherein the mixture is agitated during cooling.

11. A process as claimed in any preceding claim wherein there are a plurality of different additional vegetables which are added at different stages during cooking of the additional vegetables.

12. A process as claimed in any preceding claim comprising cooling the mixture in the vessel prior to transfer to the cooler.

13. A process as claimed in claim 12 wherein the vessel is a jacketed vessel, the vessel being heated by circulation of steam through the jacket and being cooled by circulation of cold water through the jacket.

14. A process as claimed in any preceding claim wherein the cooled mixture is packed in a pouch.

15. A process as claimed in any preceding claim comprising adding additional ingredients to the cooled mixture.

16. A process as claimed in claim 15 wherein the additional ingredients are meat or fish.

17. A process as claimed in claim 15 or 16 wherein the additional ingredients are fish or meat pieces.

18. A process as claimed in claim 17 wherein the additional ingredient pieces are prepared by:

adding seasoning to the additional ingredient pieces;

sealing the exposed surfaces of the ingredient pieces in a heated pan;

removing the sealed ingredient pieces from the heated pan;

placing the sealed ingredient pieces on a cooling rack; and

commencing blast chilling of the sealed ingredient pieces less than about 30 seconds after removal from the heated pan.

19. A process as claimed in claim 18 wherein the ingredient pieces are chicken pieces which are sealed at a pan temperature of about 320°C for a period of about 40 seconds.

20. A process as claimed in claim 18 wherein the ingredient pieces are red meat pieces which are sealed at a pan temperature of about 350°C for a period of about 30 seconds.

21. A process as claimed in claim 18 wherein the ingredient pieces are fish pieces which are sealed at a pan temperature of about 300°C for a period of from 25 to 40 seconds.

22. A process substantially as hereinbefore described.