

PROCESSED CHEESE STORED AT ROOM TEMPERATURE AND PREPARATION METHOD THEREFOR

Field of invention

The present invention relates to the dairy product field, in particular to a kind of processed cheese stored at room temperature and preparation method of the processed cheese.

Prior arts

Cheeses have unique flavor and rich nutrition, and is easily digested and absorbed, which become more and more popular with people in China. The kinds of cheeses are increasing in Chinese market, however, cheeses, both natural cheese and processed cheese, have a defect in their storage method that they could only be kept in cold storage. Otherwise, cheeses spoil quickly, in particularly, the tissue easily damaged, oil and water within cheeses gets out, the texture becomes hard and crisp, and the quality decreases seriously, so that they could not be eaten any more. Consequently, in some small-medium cities and most of countryside with undeveloped cold chain, there are few cheeses in the market, and the per capita consumption of cheeses is very low.

Content of the present invention

The technical problem to be solved in the present invention is for overcoming the defect that existing cheeses could only be kept in cold storage, to provide a kind of processed cheese stored at room temperature and the preparation method of the processed cheese.

The present invention solves the above-mentioned technical problem through the first technical solutions: a kind of processed cheese stored at room temperature, comprises the following raw materials: natural cheese 15% ~ 65%, fat product 2% ~ 14%, milk solid matter except for natural cheese and fat product 3% ~ 40%, starch 4% ~ 10%, plant protein 3% ~ 7%, antioxidant 0.1% ~ 0.5%, emulsifying salt 1.5% ~ 2.5% and water 13% ~ 25%, the percentages refer to the mass percentages that each of the composition accounts for the total amount of the raw materials; the said emulsifying salt is phosphate.

In the present invention, the said natural cheese can be the common natural cheese in this field, preferably is hard or semi hard cheese, more preferably is selected from one or more of Cheddar cheese, Gouda cheese, Mozzarella cheese and Edam Cheese.

In the present invention, the said fat product can be the common fat product in this field, including milk fat and plant oil, preferably is one or more of butter, cream, palm oil, coconut oil, rapeseed oil and sunflower oil, more preferably is butter and/or cream. The usage of the said butter is preferably 1% ~ 6%, and the usage of the said cream is preferably 1.25% ~ 10%, the percentages refer to the mass percentages that each of the composition accounts for the total amount of the raw materials.

In the present invention, the said milk solid matter except for natural cheese and fat product can be the common milk solid matter except for natural cheese and fat product in this field, preferably is one or more of skim milk powder, whole milk powder, casein power and whey protein powder, more preferably is whole milk or skim milk powder.

In the present invention, the said starch can be the common starch in this field, preferably is one or more of wheat starch, corn starch, potato starch, sweet potato starch, purple sweet potato starch and cassava starch and their modified starches, more preferably is wheat starch and/or modified starches. The usage of the said starch is particularly 4% ~ 10%, the percentage refers to the mass percentage that the composition accounts for the total amount of the raw materials.

In the present invention, the said plant protein can be the common plant protein in this field, preferably is one or more of soy protein, wheat protein, peanut protein, almond protein, walnut protein and coconut protein, more preferably is soy protein and/or wheat protein. When the said plant protein refers to soy protein and/or wheat protein, the usage of the said plant protein is particularly 3% ~ 7%, the percentage refers to the mass percentage that the composition accounts for the total amount of the raw materials.

In the present invention, the said antioxidant can be the common antioxidant in this field, preferably is one or more of vitamin E, vitamin C, carotenoids, lecithin, butylated hydroxy anisole (BHA), butylated hydroxytoluene (BHT), propyl gallate (PG), t-butyl hydroquinone (TBHQ) and phospholipid, more preferably is vitamin E, and the content of the said vitamin E is preferably 0.1% ~ 0.2%, the percentage refers to the mass percentage that the composition accounts for the total amount of the raw materials.

In the present invention, the said emulsifying salt can be the common phosphate for emulsion in this field, preferably is the mixture of sodium hexametaphosphate and sodium tripolyphosphate, and the ratio of the said sodium hexametaphosphate and sodium tripolyphosphate is preferably 2:1 ~ 5:1. The usage of the said emulsifying salt is the common usage in this field, preferably is 1.5% ~ 2.5%, the percentage refers to the mass percentage that the emulsifying salt accounts for the total amount of the raw materials.

In the present invention, the said raw materials may further include preservative. The said preservative can be the common preservative in this field, preferably is sorbic acid and/or potassium sorbate. The usage of the said preservative is the common usage in this field, preferably is less than 0.1%, the percentage refers to the mass percentage that the preservative accounts for the total amount of the raw materials.

In the present invention, the said raw materials may further include edible salt. The usage of the said edible salt is the common usage in this field, preferably is less than 1.2%, the percentage refers to the mass percentage that the composition accounts for the total amount of the raw materials.

In the present invention, the said raw materials may further include flavor substance. The said flavor substances can be the common flavor substances in this field, preferably is one or more of cod powder, edible flavor, spice, cheese flavor concentrate and cheese hydrolysate. The said edible flavor is the common edible flavor in this field, preferably is one or more of yogurt flavor, milk flavor, smoked flavor, cheese flavor and fruit flavor. The usage of edible flavor is the common usage in this field, preferably is less than 0.5%, the percentage refers to the mass percentage that the edible essence accounts for the total amount of the raw materials.

In a most preferred embodiment of in the present invention, the processed cheese stored at room temperature comprises the following raw materials: Cheddar cheese 15% ~ 50%, whole milk powder 3% ~ 40%, modified starch 0.5% ~ 2%, wheat starch 2% ~ 9.5%, butter 1% ~ 6%, cream 0% ~ 10%, soy protein 3% ~ 7%, sodium hexametaphosphate 1% ~ 1.5%, sodium tripolyphosphate 0.3% ~ 0.7%, vitamin E 0.1% ~ 0.5%, potassium sorbate 0.08% ~ 0.1%, edible

salt 0.3% ~ 1.2%, edible flavor 0% ~ 0.5% and water 13% ~ 25%.

The present invention further solves the above-mentioned technical problems through the second technical solutions: the preparation method of the processed cheese stored at room temperature includes the following steps:

- (1) Shearing and pre-mixing the raw materials;
- (2) Heating, stirring and emulsifying pulp obtained by pre-mixing;
- (3) Expulsing air and packaging;
- (4) Cooling and forming.

The detailed descriptions about the preparation method of the processed cheese stored at room temperature are as follow:

- (1) Shearing and pre-mixing the raw materials.

In the present invention, the raw materials and their preferred selections are as mentioned above, comprising natural cheese 15% ~ 65%, fat product 3.5% ~ 14%, milk solid matter except for natural cheese and fat product 3% ~ 40%, starch 4% ~ 10%, plant protein 3% ~ 7%, antioxidant 0.1% ~ 0.2%, emulsifying salt 1.5% ~ 2.5% and water 15% ~ 27.1%, the percentages refer to the mass percentages that each of the composition accounts for the total amount of the raw materials; the said emulsifying salt is phosphate. With the coordination of above raw materials and the preparation method, the processed cheese made by the said preparation method can be stored at room temperature. The operations of the said shearing and pre-mixing can be the common operations in this field, and the process for shearing and pre-mixing are generally proceeded in a melting pot; the conditions of the said shearing and pre-mixing are: temperature is preferably 35°C ~ 40°C, stirring for 1 min ~ 4 min, shearing rate is preferably 400 rpm~700 rpm.

- (2) Heating, stirring and emulsifying pulp obtained by pre-mixing.

In the present invention, the operations of heating and stirring can be the common operations in this field. The stirring rate of stirring and emulsifying is preferably 800 rpm ~ 1500 rpm, the temperature for stirring and emulsifying is preferably 88°C ~ 92°C, the controlling method of temperature for stirring and emulsifying is preferably heating directly with steam, the time for stirring and emulsifying is 2min~5min.

- (3) Expulsing air and packaging.

In the present invention, the operations of expulsing air and packaging can be the common operations in this field. The vacuum degree for packaging is -0.8~-1bar, the oxygen transmission rate of the packaging material used for packaging is less than 5 cc/m²·24h.atm.

- (4) Cooling and forming.

In the present invention, the operations of the said cooling and forming are the common post-treatment operations, generally include hot-filling and aseptic packaging, cooling and then refrigerating.

The indicators of the processed cheese in the present invention are as follows: protein 15% ~ 21%, fat 17% ~ 27%, carbohydrate 7% ~ 26%, moisture 34% ~ 40%, pH 5.2 ~ 5.9, the percentages refer to the mass percentages that each of the composition accounts for the total amount of the raw materials.

In the present invention, unless otherwise indicated, the used materials or reagents can be commercially available.

In the present invention, the mentioned optimal conditions of technical features can be optionally combined based on the general knowledge in this field, to obtain preferred

embodiments.

The positive effects of the present invention are as follows: the processed cheese produced in the present invention can be stored at room temperature, and the shelf life of the processed cheese is at least four months. The present invention breaks the situation in current Chinese market that the cheese could only be kept in cold storage, and is conducive to the promotion of the cheese market. The processed cheese has a mild flavor, and can keep the original flavor and functional characteristics of classical cheese. The processed cheese has a hard texture and can be packaged in diverse forms of snacks. The preparation method is simple, fast and easily operated.

Detailed description of the preferred embodiment:

The following examples further illustrate the present invention, but the present invention is not limited thereto. In the following embodiments, the experimental methods without specific conditions, can be carried out by conventional conditions or the conditions recommended by manufacturers.

The materials, and equipment and their models are as follow:

Natural cheese, butter and cream: Fonterra Trading (Shanghai) Co., Ltd., Bright Dairy & Food Co., Ltd;

Wheat starch and modified starch: National Starch Company, Shanghai Jiahe Food Company;

Soybean protein: Harbin high tech (Group) Co., Ltd.;

Sodium hexametaphosphate and sodium tripolyphosphate: Yunnan BK Giulini Tianchuang phosphate Co., Ltd.;

Vitamin E: DSM Co. Ltd.

Melting pot: Stephen Universal machine UM/SK 5, Sympak Asia Pacific Pte Ltd, volume: 2kg/ batch.

Embodiment 1

Raw material formulation:

Raw Material		Content wt%
Cheddar		15
Milk solid matter except for natural cheese and fat product	Whole milk powder	40
Starch	Modified starch	0.5
	Wheat starch	9.5
Fat product	Butter	1
	Cream	2.5
Plant protein	Soy protein	3
Emulsifying Salt	Sodium hexametaphosphate	1
	Sodium tripolyphosphate	0.5
Antioxidant	Vitamin E	0.1
Preservative	Potassium sorbate	0.1
Edible salt		1.2
Flavor		0.5
Water		25.1

Preparation method:

①according to the above formulation, put all raw materials into a melting pot, heat to 38℃

with steam, shear and stir at 600 rpm for 1min, obtain pre-mixed pulp;

②stir the pre-mixed pulp at 900 rpm, directly heat to 90℃ with steam, and keep the temperature for 2 min;

③hot fill, expulse air and aseptically package, vacuum degree -0.8 bar;

④cool by water.

The detected indicators of the processed cheese are: protein 15.8%; fat 17.6%; carbohydrate 26.4%; water 35.76%; pH 5.7.

Embodiment 2

Raw material formulation:

Raw Material		Content wt%
Gouda cheese		25
Milk solid matter except for natural cheese and fat product	Whole milk powder	30
Starch	Modified starch	2
	Wheat starch	6
Fat product	Butter	4
	Cream	10
Plant protein	Soy protein	4
Emulsifying Salt	Sodium hexametaphosphate	1.3
	Sodium tripolyphosphate	0.5
Antioxidant	Vitamin E	0.2
Preservative	Potassium sorbate	0.08
Edible salt		0.75
Flavor		0.3
Water		15.87

Preparation method:

①according to the above formulation, put all raw materials into a melting pot, heat to 35℃ with steam, shear and stir at 600 rpm for 1min, obtain pre-mixed pulp;

②stir the pre-mixed pulp at 1200 rpm, directly heat to 88℃ with steam, and keep the temperature for 4 min;

③hot fill, expulse air and aseptically package, vacuum degree -0.9 bar;

④cool by water.

The detected indicators of the processed cheese are: protein 16.6%; fat 24.5%; carbohydrate 20.3%; water 33.9%; pH 5.3.

Embodiment 3

Raw material formulation:

Raw Material		Content wt%
Edam Cheese		35
Milk solid matter except for natural cheese and fat product	Whole milk powder	25
Starch	Modified starch	2
	Wheat starch	3
Fat product	Butter	6
	Cream	1.25
Plant protein	Soy protein	5.5
Emulsifying Salt	Sodium hexametaphosphate	1.4

	Sodium tripolyphosphate	0.7
Antioxidant	Vitamin E	0.15
Preservative	Sorbic acid	0.1
Edible salt		0.5
Flavor		0.2
Water		19.2

Preparation method:

①according to the above formulation, put all raw materials into a melting pot, heat to 40℃ with steam, shear and stir at 700 rpm for 3 min, obtain pre-mixed pulp;

②stir the pre-mixed pulp at 1500 rpm, directly heat to 92℃ with steam, and keep the temperature for 5min;

③hot fill, expulse air and aseptically package, vacuum degree -0.8 bar;

④cool by water.

The detected indicators of the processed cheese are: protein 19.0%; fat 24.8%; carbohydrate 15.4%; water 35.9%; pH 5.5.

Embodiment 4

Raw material formulation:

Raw Material		Content wt%
Cheddar		50
Milk solid matter except for natural cheese and fat product	Whole milk powder	12
Starch	Modified starch	1
	Wheat starch	7
Fat product	Butter	4
	Cream	5
Plant protein	Soy protein	4
Emulsifying Salt	Sodium hexametaphosphate	1.2
	Sodium tripolyphosphate	0.6
Antioxidant	Vitamin E	0.15
Preservative	Sorbic acid	0.08
Edible salt		0.5
Flavor		0.09
Water		14.38

Preparation method:

①according to the above formulation, put all raw materials into a melting pot, heat to 38℃ with steam, shear and stir at 400 rpm for 4 min, obtain pre-mixed pulp;

②stir the pre-mixed pulp at 1500 rpm, directly heat to 90℃ with steam, and keep the temperature for 3 min;

③hot fill, expulse air and aseptically package, vacuum degree -0.8 bar;

④cool by water.

The detected indicators of the processed cheese are: protein 18.0%; fat 26.5%; carbohydrate 12.5%; water 37.5%; pH 5.2.

Embodiment 5

Raw material formulation:

Raw Material	Content wt%
Gouda cheese	65

Milk solid matter except for natural cheese and fat product	Whole milk powder	3
Starch	Modified starch	1.5
	Wheat starch	5.5
Fat product	Butter	2
Plant protein	Soy protein	5
Emulsifying Salt	Sodium hexametaphosphate	1.5
	Sodium tripolyphosphate	0.3
Antioxidant	Vitamin E	0.15
Preservative	Sorbic acid	0.09
Edible salt		0.3
Water		15.66

Preparation method:

①according to the above formulation, put all raw materials into a melting pot, heat to 37℃ with steam, shear and stir at 500 rpm for 3min, obtain pre-mixed pulp;

②stir the pre-mixed pulp at 700 rpm, directly heat to 92℃ with steam, and keep the temperature for 6 min;

③hot fill, expulse air and aseptically package, vacuum degree -1 bar;

④cool by water.

The detected indicators of the processed cheese are: protein 20.2%; fat 26.4%; carbohydrate 7.7%; water 39.8%; pH 5.9.

Embodiment 6

Raw material formulation:

Raw Material		Content wt%
Cheddar		50
Milk solid matter except for natural cheese and fat product	Whole milk powder	12
Starch	Modified starch	2
	Wheat starch	2
Fat product	Butter	3.25
	Cream	7.5
Plant protein	Soy protein	7
Emulsifying Salt	Sodium hexametaphosphate	1.5
	Sodium tripolyphosphate	0.5
Antioxidant	Phospholipid	0.5
Preservative	Potassium sorbate	0.1
Edible salt		0.5
Flavor		0.1
Water		13.05

Preparation method:

①according to the above formulation, put all raw materials into a melting pot, heat to 39℃ with steam, shear and stir at 600 rpm for 2 min, obtain pre-mixed pulp;

②stir the pre-mixed pulp at 800 rpm, directly heat to 90℃ with steam, and keep the temperature for 4 min;

③hot fill, expulse air and aseptically package, vacuum degree -0.9 bar;

④cool by water.

The detected indicators of the processed cheese are: protein 19.8%; fat 24.8%; carbohydrate 8.8%; water 37.6%; pH 5.4.

Embodiment 7

Raw material formulation:

Raw Material		Content wt%
Mozzarella cheese		45
Milk solid matter except for natural cheese and fat product	skim milk powder	13.5
Starch	Soy Starch	4
	Wheat starch	4
Fat product	Sunflower oil	2
	Palm oil	3
Plant protein	Peanut protein	6
Emulsifying Salt	Sodium hexametaphosphate	1
	Sodium tripolyphosphate	0.8
Antioxidant	Vitamin E	0.1
	VitaminC	0.1
Preservative	Potassium sorbate	0.1
Edible salt		0.4
Flavor		0.5
Water		19.5

Preparation method:

- ① according to the above formulation, put all raw materials into a melting pot, heat to 40℃ with steam, shear and stir at 400 rpm for 6 min, obtain pre-mixed pulp;
- ② stir the pre-mixed pulp at 800 rpm, directly heat to 90℃ with steam, and keep the temperature for 3 min;
- ③ hot fill, expulse air and aseptically package, vacuum degree -0.9 bar;
- ④ cool by water.

The detected indicators of the processed cheese are: protein 20.3%; fat 21.6%; carbohydrate 15.6%; Water 37.6%; pH5.5.

Embodiment 8

Raw material formulation:

Raw Material		Content wt%
Cheddar		60
Milk solid matter except for natural cheese and fat product	Casein power	6
Starch	Modified starch	1
	Wheat starch	5
Fat product	Butter	3
Plant protein	Soy protein	5.5
Emulsifying Salt	Sodium hexametaphosphate	1.2
	Sodium tripolyphosphate	0.6
Antioxidant	Vitamin E	0.15
Cod powder		0.5
Water		17.05

Preparation method:

①according to the above formulation, put all raw materials into a melting pot, heat to 38℃ with steam, shear and stir at 400 rpm for 5 min, obtain pre-mixed pulp;

②stir the pre-mixed pulp at 900rpm, directly heat to 90℃ with steam, and keep the temperature for 3 min;

③hot fill, expulse air and aseptically package, vacuum degree -1.0 bar;

④cool by water.

The detected indicators of the processed cheese are: protein 23.9%; fat 24.3%; carbohydrate 6.3%; water 39.8%; pH 5.6.

Effect Embodiment 1

The effect of taste evaluation for the processed cheese produced in the present invention (with samples of embodiments 1, 3 and 5) is tested with commercial Cheddar natural cheese [Fonterra Trading (Shanghai) Co., Ltd.] as a control sample. Sensory evaluation is completed by 10 raters. Scores are given according 10-point scale, 9~10 excellent; 7~8 relatively good; 5~6 common; 3~4 bad; 1~2 very bad. Scores are accumulated and the results are shown in table 1.

Table 1 data of sensory evaluation

Indicators		Control Sample	Embodiment 1	Embodiment 3	Embodiment 5
Appearance		93	94	90	90
Colour and lustre		91	88	92	90
Flavor		95	87	86	90
Taste		89	91	82	88
Comprehensive evaluation (per person)	Excellent	7	7	7	7
	Good	3	3	2	3
	Common	0	0	1	0

The data in Table 1 shows: the processed cheese produced in the present invention is not sacrificed its flavor and taste for its special characters. The samples of embodiments have almost the same comprehensive evaluation as the commercial control sample, which are fully accords with the needs of food taste.

Effect Embodiment 2

The experiment of shelf life of the processed cheese in the present invention (with sample of embodiment 2) and the control groups (commercial Cheddar natural cheese) [Fonterra Trading (Shanghai) Co., Ltd.] and plain sheet processed cheese (Bright Dairy & Food Co., Ltd)) are proceeded. The temperature of the experiment is 25 ℃. Sensory evaluation is completed by 10 raters. Scores are given according 10-point scale, 9~10 excellent; 7~8 relatively good; 5~6 common; 3~4 bad; 1~2 very bad. Scores are accumulated and the results are shown in table 2.

Table 2 data of shelf life

Shelf life	0 month			One month			Two months			Three months			Four months		
Indicator	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Appearance	92	93	90	72	45	61	72	-	56	68	-	-	71	-	-
Colour and lustre	85	91	85	80	68	58	75	-	49	74	-	-	72	-	-
Flavor	84	95	83	88	65	68	74	-	48	71	-	-	70	-	-
Taste	85	89	85	80	59	59	75	-	41	73	-	-	72	-	-

Note: A=embodiment, B=natural Cheddar cheese, C= sheet processed cheese, - refers to no

edibleness.

The result shows: the quality of Cheddar cheese is decreased obviously after being kept for one month at 25 °C, Cheddar cheese lost its edible value by the second months. The sheet processed cheese has slightly longer shelf life than natural cheese at 25 °C, but also has little edible value by the second months. The quality of the proceeded cheese of embodiment 2 is not decreased obviously within its shelf life of four months, and it can meet the consumption requirement and realize industrialization production.

CLAIMS

1. A kind of processed cheese stored at room temperature, which comprises the following raw materials: natural cheese 15% ~ 65%, fat product 2% ~ 14%, milk solid matter except for natural cheese and fat product 3% ~ 40%, starch 4% ~ 10%, plant protein 3% ~ 7%, antioxidant 0.1% ~ 0.5%, emulsifying salt 1.5% ~ 2.5% and water 13% ~ 25%, the percentages refer to the mass percentages that each of the composition accounts for the total amount of the raw materials; the said emulsifying salt is phosphate.
2. The processed cheese according to claim 1, wherein the said natural cheese is selected from one or more of Cheddar cheese, Gouda cheese, Mozzarella cheese and Edam Cheese; the said milk solid matter except for natural cheese and fat product is one or more of skim milk powder, whole milk powder, casein power and whey protein powder.
3. The processed cheese according to claim 1, wherein the said fat product is one or more of butter, cream, palm oil, coconut oil, rapeseed oil and sunflower oil; the said starch is one or more of wheat starch, corn starch, potato starch, sweet potato starch, purple sweet potato starch and cassava starch and their modified starches; the said plant protein is one or more of soy protein, wheat protein, peanut protein, almond protein, walnut protein and coconut protein; the said antioxidant is one or more of vitamin E, vitamin C, carotenoids, lecithin, butylated hydroxy anisole, butylated hydroxytoluene, propyl gallate, t-butyl hydroquinone and phospholipid.
4. The processed cheese according to claim 1, wherein the said emulsifying salt is the mixture of sodium hexametaphosphate and sodium tripolyphosphate, the ratio of sodium hexametaphosphate and sodium tripolyphosphate is 2:1~5:1.
5. The processed cheese according to claim 1, wherein the said raw materials further include one or more of preservative, edible salt and flavor substance.
6. The processed cheese according to claim 5, wherein the said preservative is sorbic acid and/or potassium sorbate, the usage of the said preservative is less than 0.1%; the usage of the said edible salt is less than 1.2%; the said flavor substances is one or more of cod powder, edible flavor, spice, cheese flavor concentrate and cheese hydrolysate.
7. The processed cheese according to claim 6, wherein the said flavor substances is edible flavor, the usage of the said edible essence is less than 0.5%, the percentage refers to the mass percentage that the edible flavor accounts for the total amount of the raw materials.

8. The processed cheese according to claim 1, wherein the processed cheese stored at room temperature comprises the following raw materials: Cheddar cheese 15% ~ 50% whole milk powder 3% ~ 40%, modified starch 0.5% ~ 2%, wheat starch 2% ~ 9.5%, butter 1% ~ 6%, cream 0% ~ 10%, soy protein 3% ~ 7%, sodium hexametaphosphate 1% ~ 1.5%, sodium tripolyphosphate 0.3% ~ 0.7%, vitamin E 0.1% ~ 0.5%, potassium sorbate 0.08% ~ 0.1%, edible salt 0.3% ~ 1.2 %, edible flavor 0% ~ 0.5% and water 13% ~ 25%.
9. The preparation method of the processed cheese stored at room temperature according to any one of the claims 1 to 8, which includes the following steps:
 - (1) Shearing and pre-mixing the raw materials;
 - (2) Heating, stirring and emulsifying pulp obtained by pre-mixing;
 - (3) Expulsing air and packaging;
 - (4) Cooling and forming.
10. The preparation method according to claim 9, wherein the conditions of the said shearing and pre-mixing in step (1) are: temperature is 35°C ~ 40°C, stirring for 1 min ~ 4 min, shearing rate is 400 rpm ~ 700 rpm;
in step (2), the rate of the said stirring and emulsifying is 800 rpm ~ 1500 rpm, the temperature for the said stirring and emulsifying is 88°C ~ 92°C, the controlling method of temperature for the stirring and emulsifying is heating directly with steam, the time for the stirring and emulsifying is 2 min ~ 5 min.