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(54) ACTIVE DRIED BAKERS' YEAST

(71) We, KONINKLIJKE NEDERLANDSCHE GIST-EN SPIRITUSFABRIEK N.V., a Dutch body corporate of 1 Wateringsweg, Delft, the Netherlands, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to active dried bakers' yeast and to a process of preparing the same.

Bakers' yeast is generally available as compressed yeast with a dry matter content of about 26 to 32% or as active dried yeast with a dry matter content of over 80%, generally over 90%.

Compressed yeast has the disadvantage of a relatively poor keeping quality so that, in practice, this kind of yeast is only of interest in countries where the temperature is relatively low and/or fresh yeast is available on a substantially daily basis.

This disadvantage does not apply to active dried yeast which, due to its high dry matter content, is remarkably stable over a prolonged period even at elevated temperatures, so that it is suitable for countries where the tem-

peratures are relatively high, e.g. tropical countries. Active dried yeast, however, has the disadvantage of a relatively low activity and, in addition, it has to be subjected to a time consuming process of rehydration in water in order to develop its activity prior to mixing it with flour for preparing the dough.

However, the drawback of a lower activity requiring larger quantities in order to obtain the same baking results, and consequently higher cost to the baker using commercially available active dried yeast, must be accepted in tropical countries in order to obtain the advantage of the better keeping quality. Consequently in non-tropical countries, there is substantially no interest in active dried yeast because of the above mentioned drawbacks.

The low activity of commercially available active dried yeasts in comparison with that of compressed yeast is shown in the following Table.

The gas production tests mentioned in this Table are described below. The active dried yeasts are from several sources and are indicated by symbols 1) to 5).

Sample of yeast	Form	Dry matter content %	Protein content (%N x 6.25) on dry matter basis	Phosphorus content (% P ₂ O ₅) on dry matter basis	Test	Gas production (ml)
1)	granules	92.7	42.4	1.90	A B ¹	500 295
2)	granules	92.6	41.9	1.97	A B ¹	493 269
3)	granules	92.4	41.5	1.92	A	444
4)	particles	91.6	42.7	1.36	A	417
5)	powder	91.8	41.6	3.36	A	369
6)	compressed	29.0	52.5	3.20	B ³	595

- It will be seen from this Table that the gas production values for the active dried yeasts are only comparable to the gas production of compressed yeast of high protein content (sample 6), when considerably larger amounts of active dried yeast are used, i.e. 870 mg of active dried yeast as compared with 450 mg of compressed yeast. When carrying out gas production tests using equal amounts of yeast, based on dry matter, the gas production values with active dried yeast are considerably lower than that for compressed yeast.
- Commercially available active dried yeast generally has a low protein content in the order of 40 to 45% (%N x 6.25, N determined by the Kjeldahl method). Such yeasts are fairly stable and resistant to the usual slow drying processes. Experience has shown that yeasts having a high protein content, are not suitable for preparing active dry yeast due to the fact that large losses of activity occur during the usually slow drying processes and moreover the product obtained is very unstable.
- Quick drying processes, e.g. spray drying, can be applied to yeasts, but such methods also have the disadvantage that they lead to an appreciable loss of activity in the yeast. In addition, very finely divided dusty powders are obtained which give rise to difficulties when they are mixed with flour or when they are rehydrated.
- We have now developed an active dried bakers' yeast having an activity, based on equal amounts of dry matter, much better than those of the best active dried bakers' yeasts commercially available at present, and even comparable to those of compressed yeasts of high quality.
- According to the invention, there is provided an active dried bakers' yeast, optionally containing one or more wetting agents, with a dry matter content of at least 85% by weight, a protein content (%N x 6.25, as determined by the Kjeldahl method) of 45 to 60% based on dry matter and an activity value of 420 to 600, for example 440 to 580, when determined according to a test method which consists of mixing 480 mg of the dried yeast in a mixer with 100 g of flour, adding 55 ml of a solution containing 2 g of NaCl and mixing the mass for 6 minutes at 28°C into a dough, placing the dough in a water bath maintained at 28°C and determining the amount of gas produced in the period from 10 to 175 minutes after the start of mixing, expressed in ml at 28°C and 760 mm Hg (this test procedure is referred to hereafter as test B²).
- The yeast according to the invention has a much higher activity than the active dried yeasts available hitherto and does not require re-hydration in order to develop its activity.
- The yeast according to the invention preferably has a dry matter content of from 90 to 96% by weight, a protein content (%N x 6.25) of from 48 to 54%, and an activity value of from 480 to 590 when determined according to test B². The keeping quality of the active dried yeast is comparable to that of the active dried yeasts which are currently commercially available.
- For bread making, the yeast according to the invention can be mixed as such with the flour and can readily be homogeneously distributed throughout the dough; this is a property which most active dried yeasts do not possess. It is a very advantageous property in that when the yeasts of the invention are mixed with the flour and water to form the dough, the yeast particles disintegrate extensively and the yeast becomes homogeneously distributed throughout the dough. In order to obtain the highest activities, the yeast according to the invention preferably contains a swelling agent and/or a wetting agent. Suitable swelling agents, which are preferably used in amounts of from 0.5 to 5%, advantageously 1 to 2%, based on dry matter, are methyl cellulose and carboxymethyl cellulose.
- Suitable wetting agents which are preferably used in small quantities of from 0.5 to 5%, advantageously 1 to 2%, based on dry matter, are esters of saturated or unsaturated fatty acids, such as fatty acid esters of sorbitan, e.g. sorbitan monolaurate, monopalmitate, monostearate or mono-oleate; fatty acid esters of glycerol, e.g. glyceryl monostearate, distearate or monopalmitate; fatty acid esters of propylene glycol, e.g. propylene glycol monostearate; or mixtures of two or more of the above mentioned compounds.
- According to another aspect of the invention, there is provided a process for preparing an active dried bakers' yeast, comprising the steps of dividing fresh compressed yeast, optionally containing one or more wetting agents, having a protein content (%N x 6.25) of 45 to 60% based on dry matter, into particles, and drying these particles in not more than 120 minutes (usually in from 3 to 120 minutes) to a dry matter content of at least 85% by weight, by means of a drying gas flow (for example using a fluidised bed) in such a manner that the particles are held within a temperature range of from 20 to 50°C, for example 20 to 40°C, during the drying process, whereby there is obtained an active dried yeast having an activity value of 420 to 600, for example 440 to 580, when determined according to test method B². Drying of the yeast particles is preferably carried out at a temperature of from 30 to 35°C.
- Preferably the drying time is less than 50 minutes and advantageously less than 20 minutes. In order to keep the particles within the above mentioned temperature range, it is advantageous that the temperature of the drying gas flow at the end of the drying period be lower than at the beginning thereof.

At the start of the drying period the temperature of the drying gas flow can be up to 160° C.

- 5 In order to facilitate the drying process and to obtain a final yeast which is easily distributable through the dough, the compressed yeast is divided into small particles, for example by extruding the yeast to form strands and breaking up the strands to form particles, 10 the particles preferably having a cross-section in the range of 0.2 to 2 mm. From yeast particles of this size, a dried yeast end product is obtained consisting of particles having a cross-section within the range of about 0.1 to 15 1 mm.

- The process according to the invention may be carried out discontinuously, but is especially suited to being carried out continuously. The invention is carried out with a yeast 20 strain having a good drying stability, for instance the strain Ng 1777 described in British Specification 989,247.

- The compressed yeast which is used as the starting material may be prepared, for example, by a process in which yeast is partially dehydrated by means of a hypotonic solution, e.g. a salt solution, and washed quickly as described in British Specification 763,926. The active dried yeast according to the invention 30 may be packed in any of the usual containers, such as tins and plastic bags, in which the dried yeast is preferably kept under a greatly reduced pressure or in a nitrogen atmosphere. Suitable plastic materials are, 35 for example, polyesters, polyamides, polyethylene, laminates of these materials or laminates with, for example, aluminium. Another suitable material is regenerated cellulose, provided with a lacquer layer.

- 40 In order that the invention may be more fully understood, the following examples are given by way of illustration only. Reference is made to tests A, B¹, B² and B³ which are described below.

- 45 *Description of the test methods used:*

- Test A. (for conventional active dried yeast). An amount of active dried yeast corresponding to 870 mg of dry matter is soaked for 10 minutes in 8 ml of water at 50 35° C. The yeast suspension obtained is mixed with 100 g of flour and 47 ml of a solution containing 2 g of NaCl, the temperatures of flour and salt solution being 28° C. The mixture obtained is mixed for 55 6 minutes into a dough, which is placed in a water bath adjusted to 28° C. The amount of gas produced within the period of from 10 to 175 minutes after the start of mixing is determined in ml at 28° C and 760 mm Hg.

- 60 Test B¹. This test is carried out in the same way as test A, except that an amount of

active dried yeast is used corresponding to 450 mg of dry matter instead of 870 mg of dry matter.

Test B². 480 mg of dried yeast (corresponding to 450 mg of dry matter) is mixed with 100 g of flour in a mixer. After addition of 55 ml of a solution containing 2 g of NaCl, the mass is mixed for 6 minutes at 28° C. The remaining operations are the same as those in test A. 70

Test B³ (for compressed yeast). An amount of compressed yeast corresponding to 450 mg of dry matter, is suspended in 55 ml of a solution containing 2 g of NaCl. After adding 100 g of flour, the dough is prepared by mixing for 6 minutes at 28° C. The remaining operations are the same as those in test A. 75

EXAMPLE I.

A centrifuged and washed yeast suspension having a dry matter content of 170 g/l was mixed with a suspension of sorbitan monostearate (wetting agent) in water to give 1 g of sorbitan monostearate per 100 g of dry yeast and the suspension was filtered to give a compressed yeast with a dry matter content of about 30%, a protein content (%N x 6.25) of 52.5% based on dry matter, and a wetting agent content of 1% based on dry matter. 80

The compressed yeast was extruded through a perforated plate having orifices of 0.6 mm diameter. The product obtained was dried to 92 to 95% dry matter by means of a stream of dry air passing through the mass of yeast. The temperature of this air varied during the drying operation; it was 60° C during the first 6 minutes and was lowered to 40° C during the next 6 minutes so that the temperature of the yeast was maintained below 40° C. The overall drying time was 12 minutes. 90

The product thus obtained had a fine granular texture and consisted of particles having a length of about 2 mm and a cross section of about 0.4 mm. The analysis of the product was: dry matter content, 93.4%; protein content (%N x 6.25), 54.0% based on dry matter; phosphorus content expressed as P₂O₅, based on dry matter, 3.20%. Its gas production by test B² was 516 ml. This product could be added as such, without preliminary soaking, to flour in order to prepare a dough and could be completely dispersed in the dough. 105

EXAMPLE II.

By way of comparison, gas production tests were made on (a) a yeast of low protein content and on (b) a yeast of high protein content. Both yeasts were tested (i) before drying, (ii) after conventional drum drying lasting about 18 hours and (iii) after the fast drying technique of the present invention. The results are set out in the Table. 115

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Drying method	Form	% dry content	Protein content (%N x 6.25) on dry matter	Phosphorus content (% P ₂ O ₅) on dry matter	Determination test	Gas production	Yeast
None	compressed	30.0	41.5	1.76	B ³	432	(a) (i)
Conventional slow drying	granules	92.8	42.7	1.82	B ²	1)	(a) (ii)
Quick drying (as described in the invention)	particles	93.0	41.6	1.78	B ²	395	(a) (iii)
None	compressed	29.0	52.5	52.5	B ³	595	(b) (i)
Conventional slow drying	granules	92.7	53.2	3.24	B ²	1)	(b) (ii)
Quick drying (according to invention)	particles	93.4	52.6	3.20	B ²	518	(b) (iii)

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fore, had a very low activity. Accordingly, it can be seen that in order to produce a dried yeast of the invention of high activity, it is necessary to use a high protein content compressed yeast starting material and to dry the yeast quickly.

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EXAMPLE III

A yeast suspension was used having the following properties: dry matter content 185 g/l; protein content (%N x 6.25) based on dry matter, 54.4%; phosphorus content expressed as P₂O₅ based on dry matter, 3.25%. The yeast was propagated under such con-

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1) Gas production was not measured, since the granules did not disintegrate homogeneously through the dough.

From the above results, it can be seen that yeast (a) (iii) had a lower activity than yeast (b) (iii). Also, undried yeast (a) (i) had a lower activity than dried yeast (b) (iii), i.e. the undried compressed low protein yeast (a) (i) had a lower activity than the dried yeast (b) (iii).

Yeast (a) (ii) and (b) (ii) were slowly dried by the conventional process and, consequently, the particles did not disintegrate and, there-

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ditions that a maximum activity in the fresh condition was obtained. This yeast was processed in the same way as in Example I using the same amount of the wetting agent. The product obtained had the following properties: dry matter content, 93.0%; protein content (%N x 6.25) based on dry matter, 54.5%; phosphorus content expressed as P_2O_5 based on dry matter, 3.26%; gas production according to test B², 560 ml.

EXAMPLE IV

Three yeast suspensions, obtained by propagating the yeast under conditions which gave maximum activity in the fresh condition, were dried in the same manner as in Example I using the same amount of the wetting agent to give active dried yeasts having the following characteristics:—

% dry matter	protein content (%N x 6.25) based on dry matter	Phosphorus content % P_2O_5 based on dry matter	Determination	Gas production (ml)
93.0	49.2	3.02	B ²	545
93.4	51.3	3.13	B ²	564
93.2	53.2	3.18	B ²	556

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EXAMPLE V

The method of Example I was repeated, except that drying was carried out so that the temperature of the yeast during drying was always about 30° C. For this purpose, air at about 100°C was first blown through the yeast mass and the air temperature was gradually lowered during drying. The overall drying time was 10 minutes. The analysis of the end product was: dry matter content, 92.4%; protein content (%N x 6.25) based on dry matter, 55.4%; phosphorus content expressed as P_2O_5 based on dry matter, 3.20%; gas production according to test B², 528 ml.

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EXAMPLE VI

The method of Example I was repeated except that during drying, air at about 150° C was first blown through the yeast mass and the air temperature was gradually reduced during drying, care being taken that the temperature of the yeast was maintained below 40° C. The overall drying time was 8 minutes. The analysis of the end product was: dry matter content, 93.3%; protein content

(%N x 6.25) based on dry matter, 52.4%; phosphorus content expressed as P_2O_5 based on dry matter, 3.15%; gas production according to test B², 520 ml.

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EXAMPLE VII

The process of Example V was repeated except that the wetting agent was a blend of glyceryl monostearate and glyceryl distearate. The analysis of the end product was: dry matter content 92.8%; protein content (%N x 6.25) based on dry matter, 53.2%; phosphorus content expressed as P_2O_5 based on dry matter, 3.16%; gas production according to test B², 521 ml.

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EXAMPLE VIII

The process of Example I was repeated except that 1.5% by weight of sorbitan monolaurate was used instead of 1% by weight of sorbitan monostearate, both based on dry matter.

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The following results were obtained by using yeasts cultivated in such a way that varying protein contents were obtained:

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% dry matter	Protein content (%N×6.25) based on dry matter	Phosphorus content (% P ₂ O ₅) based on dry matter	Gas production test B ²
92.4	45.9	2.81	452
93.5	47.4	2.85	473
93.5	49.8	3.05	492
93.5	51.3	3.12	516
92.7	53.4	3.13	514
92.5	55.6	3.20	500
93.5	56.7	3.19	489
93.0	58.5	3.20	481

EXAMPLE IX

The process of Example I was repeated except that the sorbitan monostearate was replaced by 1% methyl cellulose, which was added to the compressed yeast before drying. The results obtained are given in the following Table.

% dry matter	Protein content (%N×6.25) based on dry matter	Phosphorus content (% P ₂ O ₅) based on dry matter	Gas production test B ²
93.6	51.6	3.06	493
93.0	52.6	3.09	500

EXAMPLE X

In order to illustrate the baking quality of the yeast according to the invention, comparative baking tests were carried out with a preferred form of the product.

For these tests, the following yeasts were used: A commercially available compressed yeast with a protein content (%N x 6.25) of 46.1%; a dry matter content of 30%, and an activity of 408 (test B³) (sample A); A commercially available compressed yeast with a protein content (%N x 6.25) of 52.5%; a dry matter content of 29.0%; and an activity of 595 (test B³) (sample B); and The quickly dried active yeast according to the invention, having a high protein content (%N x 6.25) of 52.6%; a dry matter content of 93.4%; and an activity of 518 (test B²) (sample C).

For these tests, 100 parts of flour, 53 parts of water, 2 parts of NaCl and yeast were mixed together. The active dried yeast was mixed with the other components without previous soaking. 1.8 parts of the compressed yeasts were used. A quantity of the active

dried yeast (sample C) was used equal to the amount of dry matter present in the compressed yeast. The mixtures thus obtained were mixed for 15 minutes, care being taken to ensure that the temperature of the dough was 26° C. The fermentation times were as follows:

1st proof	30 minutes
2nd proof	25 minutes
intermediate proof	30 minutes
final proof	60 minutes
	145 minutes

The proofing temperature was 28 to 30° C. The dough weight for each loaf amounted to 890 g. After 30 minutes baking at a temperature of 250° C, the following loaf volumes were measured.

Loaf prepared with sample A	2925 ml
Loaf prepared with sample B	3540 ml
Loaf prepared with sample C	3495 ml

From these data, it may be seen that the active high protein dried yeast product (sample C) has a baking quality comparable to that of the compressed yeast from which it was prepared and far superior to fresh yeast of low protein content.

WHAT WE CLAIM IS:—

1. An active dried bakers' yeast with a dry matter content of at least 85% by weight, a protein content (%N x 6.25) of 45 to 60% based on dry matter and an activity of 420 to 600 when determined by the test consisting of mixing 480 mg of the dried yeast product in a mixer with 100 g of flour, adding 55 ml of a solution containing 2 g of NaCl and mixing the mass for 6 minutes at 28° C to form a dough, placing the dough in a water bath of 28° C, and determining activity as the amount of gas produced in the interval of 10 to 175 minutes after the start of mixing, read in ml at 28° C and 760 mm Hg.
2. An active dried bakers' yeast according to claim 1 which contains one or more swelling agents and/or wetting agents.
3. An active dried bakers' yeast according to claim 2, wherein the swelling agent is methyl cellulose or carboxymethyl cellulose.
4. An active dried bakers' yeast according to claim 2 or 3 wherein the amount of swelling agent is 0.5 to 5% based on dry matter.
5. An active dried bakers' yeast according to claim 2 or 3 wherein the amount of swelling agent is 1 to 2% based on dry matter.
6. An active dried bakers' yeast according to claim 2 wherein the wetting agent is an ester of a saturated or unsaturated fatty acid, a fatty acid ester of glycerol, a fatty acid ester of propylene glycol, or a mixture of two or more thereof.
7. An active dried bakers' yeast according to claim 6, wherein the wetting agent is sorbitan monolaurate, sorbitan monopalmitate, sorbitan monostearate, sorbitan mono-oleate, glyceryl monostearate, glyceryl distearate, glyceryl monopalmitate or propylene glycol monostearate.
8. An active dried bakers' yeast according to claim 2, 6 or 7 wherein the amount of wetting agent is 0.5 to 5% based on the dry matter.
9. An active dried bakers' yeast according to claim 2, 6, or 7, wherein the amount of wetting agent is 1 to 2% based on dry matter.
10. An active dried bakers' yeast according to any one of the preceding claims, having a protein content (%N x 6.25) of 48 to 54% on a dry matter basis.
11. An active dried bakers' yeast according to any one of the preceding claims, having an activity value of 480 to 590 when determined according to the test defined in Claim 1.
12. An active dried bakers' yeast according to any one of the preceding claims, having a dry matter content of 90 to 96% by weight.
13. An active dried bakers' yeast according to any one of claims 1 to 12, wherein the yeast strain is strain Ng 1777.
14. An active dried bakers' yeast substantially as herein described in any of Examples IV, VI, VIII, IX and X (sample C).
15. An active dried bakers' yeast according to any preceding claim which is sealed in a container under greatly reduced pressure or a nitrogen atmosphere, the container preferably being a tin, or a plastics bag made of polyester, polyamide or polyethylene or a laminate of two or more thereof or a laminate of one or more thereof with aluminium, or of regenerated cellulose coated with a lacquer layer.
16. A process for preparing an active dried bakers' yeast comprising the steps of dividing a fresh compressed yeast having a protein content (%N x 6.25) of 45 to 60% on dry weight basis, into particles and drying the particles in not more than 120 minutes to a dry matter content of at least 85% by weight, by means of a drying gas flow in such a manner that the particles are held within a temperature range of from 20 to 50° C whereby there is obtained a dried yeast product having an activity value of 420 to 600 when determined according to the test defined in claim 1.
17. A process according to claim 16, wherein the drying time is less than 50 minutes.
18. A process according to claim 17 wherein the drying time is less than 20 minutes.
19. A process according to claim 16, 17 or 18, wherein the temperature of the drying gas flow at the end of the drying period is lower than at the beginning thereof.
20. A process according to claim 19, wherein the temperature of the drying gas flow at the start of the drying period is not more than 160° C.
21. A process according to any one of claims 16 to 20, wherein the compressed yeast is divided into particles with a cross-section of from 0.2 to 2 mm.
22. A process according to any one of claims 16 to 21, wherein the compressed yeast is sub-divided by extrusion.
23. A process according to any one of claims 16 to 22, wherein the protein content (%N x 6.25) of the compressed yeast starting material is 48 to 54% on dry matter basis.
24. A process according to any one of claims 16 to 23, wherein the yeast is dried to a dry matter content of 90 to 96% by weight.
25. A process according to any of claims 16 to 24, wherein the compressed yeast starting material is mixed with one or more swelling agents and/or wetting agents.
26. A process according to claim 25, wherein the swelling agent is methyl cellulose or carboxy methyl cellulose.
27. A process according to claim 25 or 26, wherein the amount of swelling agent used

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From these data, it may be seen that the active high protein dried yeast product (sample C) has a baking quality comparable to that of the compressed yeast from which it was prepared and far superior to fresh yeast of low protein content.

WHAT WE CLAIM IS:—

1. An active dried bakers' yeast with a dry matter content of at least 85% by weight, a protein content (%N x 6.25) of 45 to 60% based on dry matter and an activity of 420 to 600 when determined by the test consisting of mixing 480 mg of the dried yeast product in a mixer with 100 g of flour, adding 55 ml of a solution containing 2 g of NaCl and mixing the mass for 6 minutes at 28° C to form a dough, placing the dough in a water bath of 28° C, and determining activity as the amount of gas produced in the interval of 10 to 175 minutes after the start of mixing, read in ml at 28° C and 760 mm Hg.
2. An active dried bakers' yeast according to claim 1 which contains one or more swelling agents and/or wetting agents.
3. An active dried bakers' yeast according to claim 2, wherein the swelling agent is methyl cellulose or carboxymethyl cellulose.
4. An active dried bakers' yeast according to claim 2 or 3 wherein the amount of swelling agent is 0.5 to 5% based on dry matter.
5. An active dried bakers' yeast according to claim 2 or 3 wherein the amount of swelling agent is 1 to 2% based on dry matter.
6. An active dried bakers' yeast according to claim 2 wherein the wetting agent is an ester of a saturated or unsaturated fatty acid, a fatty acid ester of glycerol, a fatty acid ester of propylene glycol, or a mixture of two or more thereof.
7. An active dried bakers' yeast according to claim 6, wherein the wetting agent is sorbitan monolaurate, sorbitan monopalmitate, sorbitan monostearate, sorbitan mono-oleate, glyceryl monostearate, glyceryl distearate, glyceryl monopalmitate or propylene glycol monostearate.
8. An active dried bakers' yeast according to claim 2, 6 or 7 wherein the amount of wetting agent is 0.5 to 5% based on the dry matter.
9. An active dried bakers' yeast according to claim 2, 6, or 7, wherein the amount of wetting agent is 1 to 2% based on dry matter.
10. An active dried bakers' yeast according to any one of the preceding claims, having a protein content (%N x 6.25) of 48 to 54% on a dry matter basis.
11. An active dried bakers' yeast according to any one of the preceding claims, having an activity value of 480 to 590 when determined according to the test defined in Claim 1.
12. An active dried bakers' yeast according to any one of the preceding claims, having a dry matter content of 90 to 96% by weight.
13. An active dried bakers' yeast according to any one of claims 1 to 12, wherein the yeast strain is strain Ng 1777.
14. An active dried bakers' yeast substantially as herein described in any of Examples IV, VI, VIII, IX and X (sample C).
15. An active dried bakers' yeast according to any preceding claim which is sealed in a container under greatly reduced pressure or a nitrogen atmosphere, the container preferably being a tin, or a plastics bag made of polyester, polyamide or polyethylene or a laminate of two or more thereof or a laminate of one or more thereof with aluminium, or of regenerated cellulose coated with a lacquer layer.
16. A process for preparing an active dried bakers' yeast comprising the steps of dividing a fresh compressed yeast having a protein content (%N x 6.25) of 45 to 60% on dry weight basis, into particles and drying the particles in not more than 120 minutes to a dry matter content of at least 85% by weight, by means of a drying gas flow in such a manner that the particles are held within a temperature range of from 20 to 50°C whereby there is obtained a dried yeast product having an activity value of 420 to 600 when determined according to the test defined in claim 1.
17. A process according to claim 16, wherein the drying time is less than 50 minutes.
18. A process according to claim 17 wherein the drying time is less than 20 minutes.
19. A process according to claim 16, 17 or 18, wherein the temperature of the drying gas flow at the end of the drying period is lower than at the beginning thereof.
20. A process according to claim 19, wherein the temperature of the drying gas flow at the start of the drying period is not more than 160° C.
21. A process according to any one of claims 16 to 20, wherein the compressed yeast is divided into particles with a cross-section of from 0.2 to 2 mm.
22. A process according to any one of claims 16 to 21, wherein the compressed yeast is sub-divided by extrusion.
23. A process according to any one of claims 16 to 22, wherein the protein content (%N x 6.25) of the compressed yeast starting material is 48 to 54% on dry matter basis.
24. A process according to any one of claims 16 to 23, wherein the yeast is dried to a dry matter content of 90 to 96% by weight.
25. A process according to any of claims 16 to 24, wherein the compressed yeast starting material is mixed with one or more swelling agents and/or wetting agents.
26. A process according to claim 25, wherein the swelling agent is methyl cellulose or carboxy methyl cellulose.
27. A process according to claim 25 or 26, wherein the amount of swelling agent used



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- is from 0.5 to 5% based on dry matter.
28. A process according to claim 27, wherein the amount of swelling agent used is from 1 to 2% based on dry matter.
- 5 29. A process according to claim 25, wherein the wetting agent is an ester of a saturated or unsaturated fatty acid, fatty acid ester of glycerol, a fatty acid ester of propylene glycol, or a mixture of two or more thereof.
- 10 30. A process according to claim 29, wherein the wetting agent is sorbitan monolaurate, monopalmitate, monostearate or mono-oleate, glyceryl monostearate, distearate or monopalmitate, or propylene glycol monostearate.
- 15 31. A process according to claim 25, 29 or 30, wherein the amount of wetting agent used is from 0.5 to 5% based on dry matter.
32. A process according to claim 31, wherein the amount of wetting agent used is from 20 1 to 2% based on dry matter.
33. A process according to any one of claims 16 to 32, wherein yeast strain Ng 1777 is used as the starting material.
34. A process according to any one of 25 claims 16 to 33, wherein the compressed yeast starting material used is prepared by partial dehydration using a hypotonic solution and and quickly washing the solution from the yeast.
- 30 35. A process according to any one of claims 16 to 34, wherein the drying step is carried out continuously.
36. A process for preparing an active dried bakers' yeast substantially as herein described 35 in any of Examples IV, VI, VIII and IX.
37. A process for packing a dried yeast as claimed in any of claims 1 to 14 or made by the process claimed in any of claims 16 to 40 36 which comprises sealing the yeast in a container under greatly reduced pressure or a nitrogen atmosphere, the container preferably being a tin, or plastics bag made of polyester, polyamide or polyethylene or a laminate of two or more thereof or a laminate of one or 45 more thereof with aluminium, or of regenerated cellulose coated with a lacquer layer.
38. A process for making baked products, wherein a yeast is used as claimed in any one of claims 1 to 14 or obtained by means of 50 the process according to any one of claims 16 to 36.
39. Baked products made by the process of the preceding claim.
40. An active dried bakers' yeast which 55 contains one or more wetting agents and has a dry matter content of at least 85% by weight, a protein content (%N x 6.25) of 45 to 60% based on dry matter and an activity value of 440 to 580 when determined by the 60 test consisting of mixing 480 mg of the dried yeast product in a mixer with 100 g of flour, adding 55 ml of a solution containing 2 g of NaCl and mixing the mass for 6 minutes at 28° C to form a dough, placing the dough in 65 a water bath of 28° C, and determining the amount of gas produced in the interval of 10 to 175 minutes after the start of mixing, read in ml at 28° C and 760 mm Hg.
41. An active dried bakers' yeast according to claim 40 wherein the wetting agent is a 70 fatty acid ester or sorbitan, a fatty acid ester of glycerol or a fatty acid ester of propylene glycol.
42. An active dried bakers' yeast according to claim 41 wherein the wetting agent is sorbitan monopalmitate, monostearate or mono- 75 oleate, glyceryl monostearate or propylene glycol monostearate.
43. An active dried bakers' yeast according to claim 40 wherein the wetting agent is a 80 mixture of glyceryl mono and di-stearate.
44. An active dried bakers' yeast according to claim 40, 41, 42 or 43 which contains from 0.5 to 5% of wetting agent based on 85 the dry matter.
45. An active dried bakers' yeast substantially as herein described in Examples I, II (b) (iii), III, V and VII.
46. A process for preparing an active dried bakers' yeast comprising the steps of dividing 90 a fresh compressed yeast containing one or more wetting agents and having a protein content (%N x 6.25) of 45 to 60% on dry weight basis, into particles and drying the particles 95 in from 3 to 120 minutes to a dry matter content of at least 85% by weight, by means of a drying gas flow in such a manner that the particles are held within a temperature range of from 20 to 40° C whereby there is obtained 100 a dried yeast product having an activity value of 440 to 580 when determined according to the test defined in claim 1.
47. A process according to claim 46 wherein the temperature of the drying gas flow at the end of the drying period is lower than at 105 the beginning thereof.
48. A process according to claim 47, wherein the temperature of the drying gas flow at the start of the drying period is not more than 110 160° C.
49. A process according to any one of claims 46 to 48, wherein the compressed yeast is divided into particles with a cross-section of from 0.2 to 2 mm.
50. A process according to any one of 115 claims 46 to 49, wherein the compressed yeast is sub-divided by extrusion.
51. A process according to any one of claims 46 to 50, wherein the wetting agent is a fatty acid ester or sorbitan, a fatty acid ester of glycerol or a fatty acid ester of propylene glycol.
52. A process according to claim 51 wherein the wetting agent is sorbitan monopalmitate, monostearate or mono-oleate, glyceryl 120 monostearate, or propylene glycol monostearate.
53. A process according to any one of claims 46 to 50 wherein the wetting agent is a mixture of glyceryl mono- and di-stearate. 130



(15)

54. A process according to any one of claims 46 to 53 wherein the amount of wetting agent used is from 0.5 to 5% based on dry matter.

55. A process for preparing an active dried bakers' yeast substantially as herein described in Example I, III, V and VII.

56. A process for making baked products, wherein a yeast is used as claimed in any one of claims 40 to 45 or obtained by means of

the process according to any one of claims 46 to 55.

57. Baked products made by the process of the preceding claim.

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