

CLAIMS

1. A combination of a thermo-labile alpha-amylase, a thermo-stable amyloglucosidase and a maltogenic amylase.
- 5 2. A combination according to claim 1, wherein the thermo-labile alpha-amylase, the thermo-stable amyloglucosidase and the maltogenic amylase are present in ratios corresponding to
 - from 20 to 48 Fau or from 28 to 40 Fau of the thermo-labile alpha-amylase,
 - 10 from 578 to 1650 Agu or from 660 to 1650 Agu of the thermo-stable amyloglucosidase, and
 - from 500 to 2500 Manu or from 1000 to 2500 Manu of the maltogenic amylase.
- 15 3. A combination according to claim 1 or 2 for use in the preparation of a bakery product with no-added sugar.
4. A combination according to any one of the preceding claims further comprising a fiber.
- 20 5. A process for producing a bakery product with no-added sugar, the process comprising
 - i) mixing flour with a content of damaged starch of at least 5% by weight with a thermo-labile alpha-amylase; a composition containing a thermo-stable amyloglucosidase and a maltogenic amylase; a yeast; water, and optionally other ingredients common
 - 25 for preparing a dough, to obtain a dough,
 - ii) optionally proofing the dough,
 - iii) optionally shaping the dough into a desired form,
 - iv) optionally, infreezing the un-baked product at a temperature in a range of from -35 °C - -45 °C for a time period of from about 15 min
 - 30 to about 30 min followed by freezing at about -18 °C, and
 - v) optionally pre-baking or baking the optionally shaped dough at a temperature in a range of from 180 to 250°C.

6. A process according to claim 5, wherein steps i), ii), and v) are included, and where step v) is a baking step (the final product is a baked product).
7. A process according to claim 5, wherein steps i), ii), and v) are included, and where
5 step v) is a pre-baking step (the final product is a pre-baked product).
8. A process according to claim 5, wherein steps i), ii), and v) are included, and where step v) is a pre-baking step followed by step iv) (the final product is a pre-baked, frozen product).
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9. A process according to claim 5, wherein steps i), ii), iii) and v) are included, and where step v) is a baking step (the final product is a baked, shaped product).
11. A process according to claim 5, wherein steps i), and iv) are included (the final product is a non-proofed, frozen, un-baked product).
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12. A process according to claim 5, wherein steps i), ii), and iv) are included (the final product is a proofed, frozen, un-baked product).
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13. A process according to claim 5, wherein steps i), ii), iii) and iv) are included (the final product is a proofed, shaped, frozen, un-baked product).
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14. A process for producing a baked product with no-added sugar, the process comprising
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- i) mixing flour with a content of damaged starch of at least 5% by weight with a thermo-labile alpha-amylase; a composition containing a thermo-stable amyloglucosidase and a maltogenic amylase; a yeast; water, and optionally other ingredients common for preparing a dough, to obtain a dough,
 - ii) proofing the dough,
 - iii) baking the dough at a temperature in a range of from 180 to 250 °C.
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15. A process according to any one of claims 5-14, wherein step ii) is included and wherein the time of proofing to obtain a specified height of the dough is reduced with from 30% to 50% compared with the time of proofing of a dough to the same specified height, wherein the comparison dough has the same ingredients apart from omission of thermo-labile alpha-amylase, thermo-stable amyloglucosidase and maltogenic amylase and apart from inclusion of 6-7% sugar.
16. A process according to any one of claims 5-15, wherein step ii) is included and wherein the time of proofing to obtain twice the height compared with the start value is at least 15 min faster such as about 15 to 30 min faster for a dough containing the combination of the three enzymes according to any one of claims 1-5 than that obtained for dough with 6% or 14% sugar without the combination of enzymes.
17. A process according to any one of claims 5-17, wherein steps i) and ii) involve the action of the thermo-labile alpha-amylase on starch polysaccharides in the flour to produce fermentable sugar.
18. A process according to any one of claims 5-17, wherein step iii) involves the action of the thermo-stable amyloglucosidase and the maltogenic amylase on poly-, oligo- and/or di-saccharides in the dough to increase the content of glucose and maltose in the baked product.
19. A combination according to any one of claims 1-4 or a process according to any one of claims 5-18, wherein the thermo-labile alpha-amylase is active at a temperature in a range of from 30 to about 65°C.
20. A combination according to any one of claims 1-4, 19 or a process according to any one of claims 5-19, wherein the thermo-labile alpha-amylase is selected from fungal alpha-amylases or bacterial alpha-amylases.
21. A combination according to any one of claims 1-4, 19-20 or a process according to any one of claims 5-20 wherein the alpha-amylase is a fungal alpha-amylase.

22. A combination according to claim 21 or a process according to claim 21, wherein the fungal alpha-amylase is an endo-amylase that hydrolyzes (1,4)-alpha-D-glucosidic linkages in starch polysaccharides and is obtained from *Aspergillus oryzae*.
- 5 23. A combination according to any one of claims 1-4, 18-22 or a process according to any one of claims 5-22, wherein the maltogenic amylase has an optimum activity in a temperature range from 57 to 65°C.
- 10 24. A combination according to any one of claims 1-4, 18-23 or a process according to any one of claims 5-23, wherein the maltogenic amylase hydrolyzes (1,4)-alpha-D-glucosidic linkages in polysaccharides.
- 15 25. A combination according to any one of claims 1-4, 18-24 or a process according to any one of claims 5-24, wherein the maltogenic amylase is selected from amylases produced by bacteria.
- 20 26. A combination according to any one of claims 1-4, 18-25 or a process according to any one of claims 5-25, wherein the maltogenic amylase is produced by *Bacillus subtilis* (Novamyl 10000 BG) or *Bacillus stearothermophilus*.
27. A combination according to any one of claims 1-4, 18-26 or a process according to any one of claims 5-26, wherein the thermostable amyloglucosidase has an optimum activity in a temperature range from 60 to 65°C.
- 25 28. A combination according to any one of claims 1-4, 18-26 or a process according to any one of claims 5-27, wherein the thermostable amyloglucosidase hydrolyzes terminal 1,4 linked alpha-D-glucosidic linkages from maltooligo- and polysaccharides to produce beta-D-glucose.
- 30 29. A combination according to any one of claims 1-4, 18-28 or a process according to any one of claims 5-28, wherein the thermostable amyloglucosidase is derived from *Aspergillus niger*.

30. A combination according to any one of claims 1-4, 18-29 or a process according to any one of claims 5-29, wherein the baked product obtained has a fructose content of at the most 1% by weight.
- 5 31. A combination according to any one of claims 1-4, 18-30 or a process according to any one of claims 5-30, wherein the yeast is *Saccharomyces cerevisiae*.
32. A baked product comprising
- 10 vi) fructose in a concentration of at the most 2.6% by weight such as at the most 2.0% by weight or about 1% by weight,
- vii) glucose in a concentration range from about 1.5 to about 4.5% by weight,
- viii) lactose in a concentration of at the most 0.5% by weight,
- ix) maltose in a concentration range of from 2.5 to 5.5% by weight,
- x) saccharose in a concentration of at the most 0.5% by weight,
- 15 wherein the concentration is based on the total weight of the baked product.
33. A baked product according to claim 32, wherein the concentration of fructose is 0.4, 0.7, 0.6, or 0.6% by weight.
34. A baked product according to claim 32 or 33, wherein the concentration of glucose is in a range from about 3.0 to about 4.5% by weight or from about 3.5 to about 4.5% by weight.
- 20 35. A baked product according to any one of claims 32-34, wherein the concentration of glucose is 3.8, 4.1, or 3.7% by weight.
36. A baked product according to any one of claims 32-35, wherein the concentration of lactose is 0.1%.
- 25 37. A baked product according to any one of claims 32-36, wherein the concentration of maltose is in a range from about 2.9 to about 3.6% by weight.
38. A baked product according to any one of claims 32-37, wherein the concentration of maltose is 4.3, 5.2, or 3.2 by weight.
39. A baked product according to any one of claims 32-38, wherein the concentration of saccharose is 0.1% by weight.
- 30 40. A baked product obtainable from the process defined in any one of claims 5-31.

41. A baked product according to any one of claims 32-40 in the form of burger buns, sandwich bread, whole bread, paninis, loaves, baguettes, bagels, ciabatta, gluten-free, or pastry.
- 5 42. A combination according to claim 1 for use in the production of a baked product without any addition of mono- or disaccharides during the production.