CLAIMS

1. A process for preparing a plant-based food dough using an extruder, said extruder comprising an extruder barrel and a cooling die, the process comprising the steps of:

A). feeding the extruder barrel with less than 35wt% by weight of non-animal protein relative to the total weight of the plant-based food dough;

B). feeding the extruder barrel with from 35 to 80wt% by weight of water relative to the total weight of the plant-based food dough,

C). feeding the extruder barrel with less than 45% by weight of a starch relative to the total weight of the plant-based food dough;

D). feeding the extruder barrel with from 1 to 30wt% by weight of a melted fat composition relative to the total weight of the plant-based food dough so as to form a plant-based food mixture;

E). extruding the plant-based food mixture obtained in step D) through the cooling die so as to form a plant-based food dough.

2. The process according to claim 1, wherein in step D), the amount of the melted fat composition is from 1% to 15% by weight relative to the total weight of the plant-based food dough, preferably from 1 to 10% by weight, more preferably from 1 to 8% by weight, and advantageously from 1 to 4% by weight; or wherein in step D), the amount of the melted fat composition is from 15 to 30% by weight relative to the total weight of the plant-based food dough, preferably from 20 to 30% by weight.

3. The process according to any of the preceding claims, wherein in step D), the melted fat composition comprises from 20% to 85% by weight of saturated fatty acid residues; from 2% to 50% by weight of stearic acid residues (C18:0), such as from 10% to 50% by weight of stearic acid (C18:0) residues; and from 1% to 35% by weight of lauric acid residues (C12:0) such as from 2% to 35% by weight of lauric acid (C12:0) residues; wherein said percentages of fatty acid residues refers to fatty acids bound as acyl groups in glycerides in the fat composition and being based on the total weight of C4 to C24 fatty acid residues bound as acyl groups present in the fat composition.

4. The process according to any of the preceding claims, wherein in step D), the melted fat composition comprises from (a) 20% to 70% by weight of saturated fatty acids, preferably from 20% to 65% by weight of saturated fatty acids, more preferably from 20% to 60% by weight of saturated fatty acids; and most preferably from 30% to 50% by weight of saturated fatty acids; or (b) from 50% to 85% by weight of saturated fatty acids, such as from 60% to 70% by weight of saturated fatty acids or from 65% to 85% by weight of saturated fatty acids.

5. The process according to any of the preceding claims, wherein in step D), the melted fat composition is a non-hydrogenated fat composition.

6. The process according to any of the preceding claims, wherein in step D), the melted fat composition comprises 35% by weight or less, preferably 30% by weight or less, more preferably 20% by weight or less, and most preferably 10% by weight or less of palmitic acid (C16:0).

7. The process according to any of the preceding claims, wherein in step D), the melted fat composition has a weight ratio of stearic acid (C18:0) to palmitic acid (C16:0) of from 1:1 to 12:1; or from 1:1 to 1:10.

8. The process according to any of the preceding claims, wherein in step D), the melted fat composition has a weight ratio of lauric acid (C12:0) to stearic acid (C18:0) of from 1:4 to 4:1; or from 4:1 to 8:1.

9. The process according to any of the preceding claims, wherein in step D), the melted fat composition comprises from 1% to 10% by weight of lauric acid (C12:0), from 10% to 25% by weight lauric acid (C12:0), or from 25% to 35% by weight of lauric acid (C12:0); and/or from 2% to 15% by weight of stearic acid (C18:0), or from 15% to 45% by weight stearic acid (C18:0).

10. The process according to any of the preceding claims, wherein in step D), the melted fat composition comprises from 1% to 25% by weight of lauric acid (C12:0); and/or from 2% to 10% by weight of stearic acid (C18:0).

11. The process according to any of the preceding claims, wherein in step D), the melted fat composition comprises less than 25% of myristic acid (C14:0), more preferably, the composition comprises less than 20% of myristic acid (C14:0), more preferably less than 15% of myristic acid (C14:0), or the composition does not comprise myristic acid.

12. The process according to any of the preceding claims, wherein in step D), the melted fat composition comprises at least one fat selected from shea butter, shea stearin, shea olein, cocoa butter, cocoa stearin, cocoa olein, allanblackia fat, kokum fat, mango kernel fat, sal fat, illipe butter, coconut oil, coconut oil stearin, coconut oil olein, palm kernel oil, palm kernel olein, palm olein, rapeseed oil, palm oil, palm kernel stearin, babassu oil, any fraction thereof and any mixture thereof.

13. The process according to any of the preceding claims, wherein in step D), the melted fat composition comprises a blend of coconut oil and rapeseed oil; preferably, the melted fat composition comprises a blend of from 20% to 80% by weight of coconut oil and from 20% to 80% by weight of rapeseed oil.

14. The process according to any of the preceding claims, wherein in step D), the

melted fat composition comprises an interesterified fat, preferably wherein the fat composition comprises an interesterified fat blend; optionally wherein the interesterified fat blend has been produced by chemical interesterification, enzymatic interesterification, or a combination thereof.

15. The process according to any of the preceding claims, wherein in step D), the melted fat composition comprises an interesterified fat blend comprising at least one fat selected from shea butter, shea stearin, shea olein, cocoa butter, cocoa stearin, cocoa olein, allanblackia fat, kokum fat, mango kernel fat, sal fat, illipe butter, and mixtures thereof; and at least one oil selected from coconut oil, coconut oil stearin, coconut oil olein, palm kernel oil, palm kernel olein, palm kernel stearin, babassu oil, and mixtures thereof.

16. The process according to any of the preceding claims, wherein in step D), the melted fat composition comprises an interesterified blend of shea butter and coconut oil and/or an interesterified blend of shea stearin and coconut oil.

17. The process according to any of the preceding claims, wherein in step D), the melted fat composition comprises an interesterified blend of from 20% to 80% by weight of shea butter and from 20% to 80% by weight of coconut oil; and/or the melted fat composition comprises an interesterified blend of from 20% to 80% by weight of shea stearin and from 20% to 80% by weight of coconut oil.

18. The process according to any of the preceding claims, wherein in step D), the melted fat composition comprises a blend of (i) from 20% to 80% by weight of an interesterified blend of from 20% to 80% by weight of shea butter and/or shea stearin and from 20% to 80% by weight of coconut oil; and (ii) from 20% to 80% by weight of sunflower oil; and/or wherein in step D), the melted fat composition comprises a blend of (i) from 20% to 80% by weight of an interesterified blend of from 20% to 80% by weight of shea butter and/or shea stearin and from 20% to 80% by weight of coconut oil; and (ii) from 20% to 80% by weight of rapeseed oil.

19. The process according to any of the preceding claims, wherein in step D), the melted fat composition comprises less than 10% by weight of palm oil, preferably, wherein the composition comprises less than 5% by weight of palm oil, more preferably, wherein the composition comprises less than 2% by weight of palm oil, and more preferably wherein the composition does not comprise palm oil.

20. The process according to any of claims 1 to 18, wherein in step D), the melted fat composition comprises an interesterified blend of palm olein and palm kernel oil.

21. The process according to any one of claims 1 to 18 or 20, wherein in step D), the melted fat composition comprises an interesterified blend of from 25% to 75% by weight

of palm olein and from 25% to 75% by weight of palm kernel oil.

22. The process according to any one of claims 1 to 18, 20 or 21, wherein in step D), the melted fat composition comprises a blend of interesterified palm olein IV 56 and palm olein IV 62-64.

23. The process according to any of claims 1 to 18 or 20 to 22, wherein in step D), the melted fat composition comprises a blend of from 20% to 80% by weight of interesterified palm olein IV 56 and from 20% to 80% by weight of palm olein IV 62-64.

24. The process according to any of the preceding claims, wherein in step D), the melted fat composition has a melting temperature above 20ºC, such as above 30ºC, such as above 35ºC, such as from 30 to 60ºC or from 40ºC to 50ºC.

25. The process according to any of the preceding claims, wherein in step D),

i). the melted fat composition has a solid fat content (SFC) N40 of less than 10, measured on unstabilised fat according to ISO 8292-1, preferably (i) from 1 to 9, and more preferably from 2 to 8, or (ii) of less than 5, more preferably of less than 3, advantageously of from 0 to 2;

ii). the melted fat composition has a solid fat content (SFC) N20 of from 35 to 60, preferably from 25 to 56, more preferably from 20 to 40, as measured on the unstabilised fat according to ISO 8292-1; or the melted fat composition has a solid fat content (SFC) N20 of from 2 to 25, preferably from 3 to 20, as measured on the unstabilised fat according to ISO 8292-1; and/or

iii). the melted fat composition has a solid fat content (SFC) N30 of from less than 36, such as from 0, or from 5 to 35, preferably from 8 to 32; more preferably from 8 to 30, as measured on the unstabilised fat according to ISO 8292-1.

26. The process according to any of claims 1 to 25, wherein the melted fat composition has a solid fat content (SFC) N35 of less than 5, measured on unstabilised fat according to ISO 8292-1, preferably 4 or less; more preferably 3 or less; and most preferably 2 or less.

27. The process according to any of the preceding claims, wherein in step D), the melted fat composition comprises from 5 to 35 percent by weight of CN46 and CN48 triglycerides, preferably from 10 to 30 percent by weight of CN46 and CN48 triglycerides.

28. The process according to any of the preceding claims, wherein in step D), the melted fat composition comprises from 2 to 12 percent by weight of St2M triglycerides, preferably from 5 to 12 percent by weight of St2M triglycerides.

29. The process according to any of the preceding claims, wherein prior to step D), a fat composition is heated so as to melt and form the melted fat composition in a melted state; preferably, wherein the fat composition is solid prior to melting.

30. The process according to any of the preceding claims, wherein in step A), the amount of non-animal protein is from 15 to 35% by weight relative to the total weight of the plant-based food dough, and preferably from 15 to 30% by weight; or wherein in step A), the amount of non-animal protein is from 0 to 15% by weight relative to the total weight of the plant-based food dough, preferably from 0 to 12.5% by weight, more preferably from 2 to 12% by weight, and advantageously from 3 to 12% by weight.

31. The process according to any of the preceding claims, wherein in step B), the amount of water is from 40 to 80wt% by weight relative to the total weight of the plant-based food dough, preferably from 50 to 80wt% by weight, more preferably from 55 to 75wt% by weight and advantageously from 60 to 75wt% by weight; or wherein the amount of water is from 35 to 55% by weight relative to the total weight of the plant-based food dough, preferably from 45 to 55% by weight or from 50 to 65% by weight.

32. The process according to any one of the preceding claims, wherein in step C), the amount of starch is from 0% to 45% by weight of a starch relative to the total weight of the plant-based food dough, preferably from 1 to 45% by weight, more preferably from 5% to 45% by weight, and advantageously from 20% to 30% by weight.

33. The process according to any of the preceding claims, wherein no animal protein is fed in the process.

34. The process according to any of the preceding claims, wherein no animal-derived ingredient is fed in the process.

35. The process according to any of the preceding claims, wherein steps A), B) and C) are realized simultaneously so that the non-animal protein and the starch are mixed with the water so as to form a slurry before feeding to the extruder barrel and are followed by step D) and step E).

36. The process according to claim 35, wherein the melted fat composition is fed at the same location, at a location upstream or at a location downstream of the feeding location of the slurry.

37. The process according to any of claims 1 to 36, wherein steps A) and C) are realized simultaneously after step B) so that the non-animal protein and the starch are mixed so as to form a mixture before feeding to the extruder barrel and are followed by step D) and step E).

38. The process according to any of claims 1 to 36, wherein steps A) and C) are

realized simultaneously so that the non-animal protein and the starch are mixed so as to form a mixture before feeding to the extruder barrel and are followed by step B), step D) and step E).

39. The process according to claim 37 or 38, wherein the melted fat composition, and the mixture of non-animal protein and starch are independently from each other fed at the same location, at a location upstream or at a location downstream of the feeding location of water.

40. The process according to any of claims 1 to 36, wherein steps A), C) and D) are realized simultaneously so that the non-animal protein, starch and the melted fat are mixed together so as to form a fat mixture before feeding to the extruder barrel and are followed by steps B) and E).

41. The process according to claim 40, wherein the fat mixture is fed at the same location, at a location upstream or at a location downstream of the feeding location of water.

42. The process according to any one of claims 1 to 36, wherein steps B) and D) are realized simultaneously after steps A) and C) so that water and the melted fat are mixed together so as to form an emulsion before feeding to the extruder barrel and are followed by step E).

43. The process according to any of the preceding claims, wherein the process comprises a step F) of shaping the plant-based food dough into a plant-based food product; preferably wherein the shaping step F) is performed by cutting, moulding, pressing, rolling, grinding, dicing, marination, or any combination thereof.

44. The process according to any of the preceding claims, wherein the process comprises a step G) of at least partially cooking the plant-based food dough into a plant-based food product; preferably wherein the cooking step G) comprises a baking step, a boiling step, a frying step, a steaming step and/or a microwaving step.

45. A plant-based food dough obtainable by a process according to any of claims 1 to 42, wherein the plant-based food dough has a chewiness from 3600 to 5000 g.

46. The plant-based food dough according to claim 45, wherein the plant-based food dough has a hardness from 8000 to 11000g.

47. A plant-based food product obtainable by the process of any of claims 43 to 44.

48. The plant-based food product according to claim 47, wherein the plant-based food product is an uncooked food product, a cooked food product, or a partially cooked food product.

49. The plant-based food product according to claim 47 or 48, wherein the plant-based

food product is selected from a meat analogue composition, a cheese analogue composition or a seafood analogue composition.

50. The plant-based food product according to claim 49, wherein the food product is a vegetarian or vegan meat substitute food product; preferably wherein the vegetarian or vegan meat substitute food product is a burger, sausage, meat ball, nugget, patty, mince product, breast, meatloaf, or other product intended to mimic conventional meat-based food products.

51. The plant-based food product according to claim 50, wherein the food product is a vegetarian or vegan cheese substitute food product; preferably wherein the food product comprises a pizza cheese, a sandwich cheese, a feta cheese, a soft spreadable cheese, or a hard cheese; preferably wherein the food product comprises a pizza cheese, a sandwich cheese, or a feta cheese.

52. The plant-based food product according to claim 49, wherein the food product is a vegetarian or vegan seafood substitute food product; preferably wherein the food product is a calamari analogue product, prawn analogue product, lobster analogue product, crab analogue product, crabstick analogue product, scampi analogue product and fish analogue product; preferably wherein the food product is a calamari analogue food product.

53. Use of a fat composition in a plant-based food dough or a plant-based food product, wherein the plant-based dough or plant-based food product is obtainable by a process according to any of claims 1 to 44; wherein the fat composition is as defined in any of claims 1 to 29; and wherein the use comprises using the fat composition to (i) improve the hardness of the plant-based food product or plant-based dough when compared to an analogous food product or plant-based dough comprising the same amount by weight of liquid oil, or a food product or plant-based dough that does not comprise any fat or oil; (ii) improve the chewiness of the plant-based food product or plant-based dough when compared to an analogous food product or plant-based dough comprising the same amount by weight of liquid oil, or a food product or plant-based dough that does not comprise any fat or oil; (iii) improve the fibrosity of the plant-based food product or plant-based dough when compared to an analogous food product or plant-based dough comprising the same amount by weight of liquid oil; or (iv) improve the mouthfeel of the plant-based food product or plant-based dough when compared to an analogous food product or plant-based dough comprising the same amount by weight of liquid oil, or a food product or plant-based dough that does not comprise any fat or oil.

54. Use according to claim 53, wherein the use comprises carrying out the process

according to any of claims 1 to 44 with the fat composition.