

Claims

1. A microencapsulated composition comprising one or more hydrophobic materials encapsulated by an encapsulant, wherein the encapsulant comprises one or more modified proteins and/or peptides; and wherein the one or more modified proteins and/or peptides are obtained from a starting protein by subjecting the starting protein to a high shear process, such that the average particle size of the one or more modified proteins and/or peptides is reduced relative to the starting protein.
2. The microencapsulated composition according to claim 1, wherein the average particle size of the one or more modified proteins and/or peptides is about 70% or less of the average particle size of the starting protein.
3. The microencapsulated composition according to claim 2, wherein the average particle size of the one or more modified proteins is about 65% or less of the average particle size of the starting protein.
4. The microencapsulated composition according to any one of claims 1 to 3, having a surface fat free content of less than about 1.8%.
5. The microencapsulated composition according to claim 4, having a surface fat free content of less than about 1%.
6. The microencapsulated composition according to claim 5, having a surface fat free content of less than about 0.8%.
7. The microencapsulated composition according to any one of claims 1 to 6, wherein the high shear process is carried out at alkaline pH.
8. The microencapsulated composition according to claim 7, wherein the high shear process is carried out at a pH of about 8.
9. The microencapsulated composition according to any one of claims 1 to 8, wherein the high shear process comprises subjecting the starting protein to a pressure of from about

20 mPa to about 300 mPa.

10. The microencapsulated composition according to any one of claims 1 to 9, wherein the high shear process is a homogenisation process.

11. The microencapsulated composition according to any one of claims 1 to 10, wherein the high shear process is a microfluidisation process.

12. The microencapsulated composition according to any one of claims 1 to 11, wherein the one or more modified proteins and/or peptides are in the form of a protein fraction.

13. The microencapsulated composition according to any one of claims 1 to 12, wherein the modified protein is modified whey protein.

14. The microencapsulated composition according to any one of claims 1 to 13, wherein the encapsulant further comprises one or more carbohydrates.

15. The microencapsulated composition according to claim 14, wherein the one or more carbohydrates are selected from glucose syrup and dextrose monohydrate, or a combination thereof.

16. The microencapsulated composition according to any one of claims 1 to 15, wherein the one or more modified proteins and/or peptides are present at from about 3% w/w to about 25% w/w based on the total weight of the composition.

17. The microencapsulated composition according to any one of claims 1 to 16 wherein the ratio of the modified protein component of the encapsulant to the carbohydrate component of the encapsulant is in the range of about 1:10 to 1:1.

18. The microencapsulated composition according to any one of claims 1 to 17, wherein the hydrophobic material is an edible oil.

19. The microencapsulated composition according to any one of claims 1 to 18, wherein the hydrophobic material comprises one or more long-chain polyunsaturated fatty acids (LCPUFAs).
20. The microencapsulated composition according to claim 19, wherein the LCPUFAs comprise omega-3 fatty acids and/or omega-6 fatty acids.
21. The microencapsulated composition according to claim 19 or 20, wherein the LCPUFAs are present in triglyceride form.
22. The microencapsulated composition according to any one of claims 19 to 21, wherein the LCPUFAs are present in one or more LCPUFA-containing oils.
23. The microencapsulated composition according to claim 22, wherein the one or more oils comprise a fish oil.
24. The microencapsulated composition according to claim 23, wherein the fish oil is tuna oil.
25. The microencapsulated composition according to any one of claims 1 to 24, wherein the composition further comprises at least one source of vitamin C.
26. The microencapsulated composition according to any one of claims 1 to 25, wherein the composition is in the form of an oil-in-water emulsion.
27. The microencapsulated composition according to any one of claims 1 to 26, wherein the composition is in the form of a spray dried powder.
28. A method for protecting a hydrophobic material from oxidative degradation, comprising:
subjecting a starting protein to a high shear process producing one or more modified proteins and/or peptides, such that the average particle size of the one or more modified

proteins and/or peptides is reduced relative to the starting protein; and
encapsulating the one or more hydrophobic materials with an encapsulant comprising the one or more modified proteins and/or peptides.

29. A method for improving the oxidative stability of a hydrophobic material, comprising:
subjecting a starting protein to a high shear process producing one or more modified proteins and/or peptides, such that the average particle size of the one or more modified proteins and/or peptides is reduced relative to the starting protein; and
encapsulating the one or more hydrophobic materials with an encapsulant comprising the one or more modified proteins and/or peptides.

30. A method for reducing the surface free fat of a microencapsulated composition comprising one or more hydrophobic materials encapsulated by an encapsulant, comprising
subjecting a one or more starting proteins and/or peptides to a high shear process producing one or more modified proteins and/or peptides, such that the average particle size of the one or more modified proteins and/or peptides is reduced relative to the one or more starting proteins and/or peptides; and
encapsulating the one or more hydrophobic materials with an encapsulant comprising the one or more modified proteins and/or peptides.

31. The method according to any one of claims 28 to 30, wherein the average particle size of the one or more modified proteins and/or peptides is about 70% or less of the average particle size of the starting protein

32. The method according to claim 31, wherein the average particle size of the one or more modified proteins and/or peptides is about 65% or less of the average particle size of the starting protein.

33. The method according to any one of claims 28 to 32, wherein the high shear process is carried out at alkaline pH.

34. The method according to claim 33, wherein the high shear process is carried out at a

pH of about 8.

35. The method according to any one of claims 28 to 34, wherein the hydrophobic material comprises one or more LCPUFAs.

36. The method according to claim 35, wherein the one or more LCPUFAs are in triglyceride form.

37. A stable emulsion comprising a hydrophobic material, wherein said emulsion further comprises one or more modified proteins and/or peptides, and wherein the one or more modified proteins and/or peptides are obtained from a starting protein by subjecting the starting protein to a high shear process, such that the average particle size of the one or more modified proteins and/or peptides is reduced relative to the starting protein.

38. The stable emulsion according to claim 37, wherein the average particle size of the one or more modified proteins and/or peptides is about 70% or less of the average particle size of the starting protein.

39. The stable emulsion according to claim 38, wherein the average particle size of the one or more modified proteins and/or peptides is about 65% or less of the average particle size of the starting protein.

40. The stable emulsion according to any one of claims 37 to 39, wherein the high shear process is carried out at alkaline pH.

41. The stable emulsion according to claim 40, wherein the high shear process is carried out at a pH of about 8.

42. The stable emulsion according to any one of claims 37 to 41, wherein the hydrophobic material comprises one or more LCPUFAs.

43. The stable emulsion according to claim 42, wherein the LCPUFAs are in triglyceride form.

44. A composition comprising a hydrophobic material and one or more modified proteins and/or peptides, wherein the one or more modified proteins and/or peptides are obtained from a starting protein by subjecting the starting protein to a high shear process, such that the average particle size of the one or more modified proteins and/or peptides is reduced relative to the starting protein.