

CLAIMS

We claim:

1. A structured food product, comprising a protein product from a microorganism.
2. The structured food product according to claim 1, wherein the microorganism comprises a chemoautotrophically grown microorganism.
3. The structured food product according to claim 2, wherein the chemoautotrophically grown microorganism comprises a *Cupriavidus* microorganism.
4. The structured food product according to claim 1, wherein the microorganism is a first microorganism grown on a nutritional source that comprises a protein product from a second microorganism.
5. The structured food product according to claim 4, wherein the second microorganism comprises a *Cupriavidus* microorganism.
6. The structured food product according to claim 4, wherein the first microorganism is a generally recognized as safe (GRAS) microorganism.
7. The structured food product according to claim 1, wherein the microorganism is a non-genetically modified organism (non-GMO).
8. The structured food product according to claim 1, wherein the food product does not contain animal-derived biomolecules.
9. The structured food product according to claim 1, wherein the protein product comprises one or more of single cell protein, cell lysate, protein isolate, protein extract, protein hydrolysate, free amino acids, peptides, oligopeptides, or combinations thereof.
10. The structured food product according to claim 1, comprising about 5% to about 50% protein by weight from the microorganism protein product.
11. The structured food product according to claim 1, wherein the food product is a structured meat analogue product.

12. The structured food product according to claim 11, wherein the structured meat analogue product is a structured beef, poultry, pork, fish, or seafood analogue product.
13. The structured food product according to claim 11, wherein the structured meat analogue product reproduces a texture and/or organoleptic characteristic of natural meat.
14. The structured food product according to claim 11, wherein the meat analogue product mimics the structure of ground or muscle meat.
15. The structured food product according to claim 11, wherein the structured meat analogue product comprises a flavohemoprotein flavorant.
16. The structured food product according to claim 15, wherein the flavohemoprotein flavorant is produced by the microorganism.
17. The structured food product according to claim 16, wherein the microorganism is a chemoautotrophically grown microorganism.
18. The structured food product according to claim 17, wherein the chemoautotrophically grown microorganism is a *Cupriavidus* microorganism.
19. The structured food product according to claim 1, wherein the structured food product is supplemented with vitamins and/or nutrients.
20. The structured food product according to claim 19, wherein the supplemental vitamins and/or nutrients comprise at least one of amino acids, lipids, oils, fatty acids, vitamin B12, biotin, antioxidants, minerals, surfactants, and emulsifiers.
21. The structured food product according to claim 19 wherein the structured food product is a structured meat analogue product.
22. A dough composition for production of a structured food product, comprising a protein product from a microorganism.
23. The dough composition according to claim 22, wherein the microorganism comprises a chemoautotrophically grown microorganism.

24. The dough composition according to claim 23, wherein the chemoautotrophically grown microorganism comprises a *Cupriavidus* microorganism.
25. The dough composition according to claim 22, wherein the protein product comprises one or more of single cell protein, cell lysate, protein isolate, protein extract, protein hydrolysate, free amino acids, peptides, oligopeptides, or combinations thereof.
26. The dough composition according to claim 25, wherein the protein product comprises a protein hydrolysate.
27. The dough composition according to claim 26, wherein the average molecular weight of proteins in the hydrolysate is about 5 kD to about 10 kD.
28. The dough composition according to claim 26, wherein the protein hydrolysate is produced under conditions that retain undenatured globular protein.
29. The dough composition according to claim 28, wherein the conditions that retain undenatured globular protein comprise mild cell lysis and physical separation of soluble components from cell debris,
30. The dough composition according to claim 26, wherein partially or fully hydrolyzed protein product is added to a second protein product to promote structuring and/or fiber formation.
31. The dough composition according to claim 30, wherein the second protein product comprises one or more of wheat gluten, soy, pea, wheat, milk, algae, and other non-animal proteins.
32. The dough composition according to claim 22, wherein the water content of the dough is about 40% (w/w) to about 80% (w/w).
33. The dough composition according to claim 22, wherein the shear strength of the dough is greater than about 1000 psig.
34. A method for producing a structured food product, comprising:
(a) culturing a microorganism in the presence of a carbon source, thereby producing biomass that comprises protein;

- (b) converting the biomass into a protein product; and
- (c) processing the protein product into a structured food composition.

35. The method according to claim 34, wherein step (a) comprises chemoautotrophic culture conditions.

36. The method according to claim 34, wherein the carbon source comprises a gaseous C1 molecule.

37. The method according to claim 36, wherein the gaseous C1 molecule comprises carbon dioxide.

38. The method according to claim 35, wherein the microorganism comprises a *Cupriavidus* microorganism.

39. The method according to claim 34, wherein the protein product comprises one or more of single cell protein, cell lysate, protein isolate, protein extract, protein hydrolysate, free amino acids, peptides, oligopeptides, or combinations thereof.

40. The method according to claim 39, wherein step (c) comprises processing the protein product into a dough composition.

41. The method according to claim 40, further comprising thermochemical processing of the dough.

42. The method according to claim 41, wherein the thermochemical processing comprises extrusion.

43. The method according to claim 39, wherein step (c) comprises a spinning process, thereby producing fibers.

44. The method according to claim 39, wherein step (c) comprises a process for structured hydrocolloid formation.

45. The method according to claim 34, wherein the structured food product is a structured meat analogue product.

46. The method according to claim 45, wherein the structured meat analogue product is a structured beef, poultry, pork, fish, or seafood analogue product.
47. The method according to claim 45, wherein the structured meat analogue product reproduces a texture and/or organoleptic characteristic of natural meat.
48. The method according to claim 45, wherein the meat analogue product mimics the structure of ground or muscle meat.
49. The method according to claim 45, wherein the structured meat analogue product comprises a flavohemoprotein flavorant.
50. The structured food product according to claim 49, wherein the flavohemoprotein flavorant is produced by the microorganism.
51. The structured food product according to claim 50, wherein the microorganism is a *Cupriavidus* microorganism.
52. A thermochemical process for processing a dough composition according to claim 22 into a structured meat analogue composition, comprising extruding the dough composition to produce aligned fibers.
53. A thermochemical process according to claim 52, wherein the protein product comprises a protein hydrolysate.
54. The thermochemical process according to claim 53, wherein the microorganism comprises a chemoautotrophically grown microorganism.
55. The thermochemical process according to claim 54, wherein the chemoautotrophically grown microorganism comprises a *Cupriavidus* microorganism.