WHAT IS CLAIMED

1. An extrudate comprising cultivated animal cells, a plant protein, at least one other ingredient, and optionally, a peptide cross-linking enzyme.

2. The extrudate of claim 1, wherein the cultivated animal cell is selected from the group consisting of an avian cell, a bovine cell, a porcine cell, and a seafood cell.

~~3. The extrudate of claim 2, wherein the avian cell is selected from the group consisting of chicken cells, turkey cells, duck cells, goose cells, pheasant cells, and squab cells.~~

~~4~~3. The extrudate of ~~any one of~~ claim~~s~~ 1 ~~to~~ or claim ~~3~~2, wherein the cultivated animal cell is of the genus *Gallus Meleagris, Anas, Bos* or *Sus.*

~~5~~4. The extrudate of any one of claims 1 to ~~4~~3, wherein the extrudate comprises cultivated animal cells in an amount that is between 1% to 90% by dry weight.

~~6. The extrudate of claim 5, wherein the extrudate comprises cultivated animal cells in an amount that is between 10% to 90% by dry weight, 20% to 90% by dry weight, 30% to 90% by dry weight, 40% to 90% by dry weight, 50% to 90% by dry weight, 60% to 90% by dry weight, 70% to 90% by dry weight, or 80% to 90% by dry weight.~~

~~7~~5. The extrudate of any one of claims 1 to ~~6~~4, wherein the plant protein is a plant protein isolate or a plant protein concentrate.

~~8. The extrudate of any one of claims 1 to 7, wherein the plant protein isolate or plant protein concentrate is obtain from a plant selected from the group consisting of a protein isolated from a pulse, vetch, grain, nut, macroalgae, and microalgae.~~

~~9~~6. The extrudate of any one of claims 1 to ~~8~~5, wherein the plant protein is a pulse protein.

~~10~~7. The extrudate of any one of claims 1 to ~~9~~6, wherein the pulse plant protein is a pulse selected from the group consisting of dry beans, lentils, mung beans, fava beans, dry peas,

chickpeas, cowpeas, bambara beans, pigeon peas, lupins, vetches, adzuki, common beans, fenugreek, long beans, lima beans, runner beans, or tepary beans, soy beans, and mucuna beans.

~~11~~8. The extrudate of claim ~~10~~7, wherein the pulse protein is obtained from mung beans (*Vigna radiata*).

~~12. The extrudate of any one of claims 1 to 11, wherein the extrudate comprises plant protein in an amount that is between 1% to 90% by dry weight.~~

~~13. The extrudate of claim 12, wherein the extrudate comprises plant protein in an amount that is between 1% to 90% by dry weight, 5% to 10% by dry weight, 10% to 15% by dry weight, 15% to 20% by dry weight, 25% to 30% by dry weight, 30% to 35% by dry weight, 35% to 40% by dry weight, 45% to 50% by dry weight, 50% to 55% by dry weight, 55% to 60% by dry weight, 60% to 65% by dry weight, 65% to 70% by dry weight, or 70% to 75% by dry weight.~~

~~14~~9. The extrudate of any one of claims 1 to ~~13~~8, wherein the extrudate comprises a peptide cross-linking enzyme.

~~15. The extrudate of claim 14, wherein the peptide cross-linking enzyme is selected from the group consisting of transglutaminase, sortase, subtilisin, tyrosinase, laccase, peroxidase, and lysyl oxidase.~~

~~16. The extrudate of claim 15, wherein the peptide cross-linking enzyme is transglutaminase.~~

~~17. The extrudate of any one of claims 14 to 16, wherein the cross-linking is present in an amount that is between 0.0001-0.025% by weight.~~

~~18. The extrudate of claim 17, wherein cross-linking is present in an amount that is between 0.0001-0.025% by weight, 0.0001%-0.020% by weight, 0.0001%-0.0175% by weight, 0.0001%-0.0150% by weight, 0.0001%-0.0125% by weight, 0.0001%-0.01%, by weight 0.0001%-0.0075% by weight, 0.0001%-0.005% by weight, 0.0001%-0.0025% by weight,~~

~~0.0001%-0.002%, by weight 0.0001%-0.0015% by weight, 0.0001%-0.001% by weight, or 0.0001%-0.00015% by weight~~

~~19~~10. The extrudate of any one of claims 1~~-18~~ to 9, wherein the at least one other ingredient is selected from the group consisting lipid, salt, sugar, fiber, humectant, flavorant, colorant, and preservative.

~~20~~11. The extrudate of claim ~~19~~10, wherein the composition of the lipid is a free fatty acid, triacylglycerol, or sterol.

~~21. The extrudate of claim 20, wherein the free fatty acid or triacylglycerol comprises saturated fatty acids or unsaturated fatty acid.~~

~~22. The extrudate of any one of claims 19 to 21, wherein the lipid is obtained a plant.~~

~~23~~12. The extrudate of claim ~~22~~11, wherein the lipid is a plant oil selected from the group consisting of algal oil, canola oil, coconut oil, olive oil, palm oil, palm kernel oil, peanut oil, rice bran oil, safflower oil, soybean oil, sunflower oil, and mixtures thereof.

~~24. The extrudate of any one of claims 19 to 23, wherein the lipid is present in an amount that is between 1% to 90% by dry weight, 5% to 10% by dry weight, 10% to 15% by dry weight, 15% to 20% by dry weight, 25% to 30% by dry weight, 30% to 35% by dry weight, 35% to 40% by dry weight, 45% to 50% by dry weight, 50% to 55% by dry weight, 55% to 60% by dry weight, 60% to 65% by dry weight, 65% to 70% by dry weight, or 70% to 75% by dry weight.~~

~~25~~13. The extrudate of claim ~~19~~10, wherein the salt is selected from the group consisting of sodium chloride, ammonium sulfate, ammonium phosphate, ammonium chloride, potassium chloride, potassium sulfate, or potassium phosphate, and a phosphate salt.

~~26. The extrudate of claim 25, wherein the phosphate salt is selected from the group consisting of disodium phosphate (DSP), sodium hexamethaphosphate (SHMP), and~~

~~tetrasodium pyrophosphate (TSPP).~~

~~27~~14. The extrudate of any one of claims ~~19~~ 10 to ~~26~~13, wherein the extrudate comprise soluble fiber and/or insoluble fiber.

~~28. The extrudate of claim 27, wherein the fiber is present in an amount that is between 1% to 50% by dry weight, 5% to 10% by dry weight, 10% to 15% by dry weight, 15% to 20% by dry weight, 25% to 30% by dry weight, 30% to 35% by dry weight, 35% to 40% by dry weight, or 45% to 50% by dry weight.~~

~~29~~15. The extrudate of any one of claims ~~19~~ 10 to ~~28~~14, wherein the extrudate comprises a humectant.

~~30. The extrudate of claim 29, wherein the humectant is selected from the group consisting of modified starch, unmodified starch, and polyol.~~

~~31. The extrudate of claim 30, wherein the polyol is selected from the group consisting of glycerol, propylene glycol, and polydextrose.~~

~~32. The extrudate of any one of claims 29 to 31, wherein the humectant is present in an amount that is between 1% to 25% by dry weight, 1% to 20% by dry weight, 1% to 15% by dry weight, 1% to 10% by dry weight, or 1% to 5% by dry weight.~~

~~33~~16. The extrudate of any one of claims 1 to ~~32~~15, wherein the density of the extrudate is between 0.1 g/cm^3 to about 1 g/cm^3, between 0.1 g/cm^3 to about 0.15 g/cm^3, between 0.15 g/cm^3 to 0.2 g/cm^3, between 0.2 g/cm^3 to 0.25 g/cm^3, between 0.25 g/cm^3 to 0.3 g/cm^3, between 0.3 g/cm^3 to 0.35 g/cm^3, between 0.35 g/cm^3 to 0.4 g/cm^3, between 0.4 g/cm^3 to 0.45 g/cm^3, between 0.45 g/cm^3 to 0.5 g/cm^3, between 0.5 g/cm^3 to 0.55 g/cm^3, between 0.55 g/cm^3 to 0.6 g/cm^3, between 0.6 g/cm^3 to 0.65 g/cm^3, between 0.65 g/cm^3 to 0.7 g/cm^3, between 0.7 g/cm^3 to 0.75 g/cm^3, between 0.75 g/cm^3 to 0.8 g/cm^3, between 0.8 g/cm^3 to 0.85 g/cm^3, between 0.85 g/cm^3 to 0.9 g/cm^3, between 0.9 g/cm^3 to 0.95 g/cm^3, or between 0.95 g/cm^3 to 1 g/cm^3.

~~34~~17. The extrudate of any one of claims 1 to ~~33~~16, wherein the extrudate has a fibrous structure.

~~35. The extrudate of any one claims 1 to 34, wherein the extrudate has a Warner-Bratzler score of between 5 N to 100 N, between 5 N to 10 N, between 10 N to 15 N, between 15 N to 20 N, between 20 N to 25 N, between 25 N to 30 N, between 35 N to 40 N, between 40 N to 45 N, between 45 N to 50 N, between 55 N to 60 N, between 60 N to 65 N, between 65 N to 70 N, between 70 to 75 N, between 75 N to 80 N, between 80 N to 85 N, between 85 N to 90 N, between 90 N to 95 N, or between 95 N to 100 N.~~

~~36. The extrudate of any one of claims 1 to 35, wherein the extrudate has a hardness as measured by a puncture test of between 1 N and 50 N, between 1 N and 45 N, between 1 N and 40 N, between 1 N and 35 N, between 1 N and 30 N, between 1 N and 25 N, between 1 N and 20 N, between 1 N and 15 N, between 1 N and 10 N, between 1 N and 9 N, between 1 N and 8 N, between 1 N and 7 N, between 1 N and 6 N, between 1 N and 5 N, between 1 N and 4 N, between 1 N and 3 N, between 1 N and 2 N, between 2 N and 15 N, between 2 N and 10 N, between 2 N and 9 N, between 2 N and 8N, between 2 N and 7 N, between 2 N and 6 N, between 2 N and 5 N, between 2 N and 4 N, or between 2 N and 3 N.~~

~~37~~18. The extrudate of any one of claims 1 to ~~36~~17, wherein the cultivated animal cells are cultivated in a suspension culture or an adherent culture.

~~38. The extrudate of claim 37, wherein the cultivated animal cells are cultivated in a growth medium that comprises animal serum.~~

~~39. The extrudate of claim 37, wherein the cultivated animal cells are cultivated in a growth medium that does not comprise animal serum.~~

~~40~~19. The extrudate of any one of claims 1 to ~~39~~18, wherein the extrudate is a scaffold.

~~41~~20. The extrudate of any one of claims 1 to ~~40~~19, wherein the extrudate is a substrate for 3D printing.

42. A method of preparing an extrudate comprising cultivated animal cells, a plant protein, at least one other ingredient, and optionally, a peptide cross-linking enzyme, the method comprising the steps of:

a) preparing a dough contacting water and plant protein;

b) placing the dough into a hopper of an extrusion machine;

c) transferring the dough from the hopper into the barrel of the extrusion machine;

d) conveying the dough through the barrel under mechanical pressure, optionally heating the dough in the barrel;

e) injecting the cultivated animal cells into the barrel during conveyance of the dough to prepare dough/cell admixture; and

f) extruding the dough/cell admixture through a die to produce the extrudate;

wherein, the at least one other ingredient is added to the dough prior to placing the dough into the hopper, or the at least one other ingredient is injected into the barrel before, during, after or together with injection of the cultivated animal cells into the barrel.

43. A method of preparing an extrudate comprising cultivated animal cells, a plant protein, at least one other ingredient, and optionally, a peptide cross-linking enzyme, the method comprising the steps of:

a) Preparing a dough/cell admixture by contacting water, plant protein and the cultivated animal cells;

b) Placing the dough/cell admixture into a hopper of an extrusion machine;

c) transferring the dough/cell admixture from the hopper into the barrel of the extrusion machine;

d) conveying the dough/cell admixture through the barrel under mechanical pressure, optionally heating the dough/cell admixture in the barrel; and

e) extruding the dough/cell admixture through a die to produce the extrudate;

f) wherein, the at least one other ingredient is incorporated into the dough/cell admixture prior to placing the dough/cell admixture into the hopper, or the at least one other ingredient is injected into the barrel during the conveyance of the dough/cell admixture through the barrel.

44. A method of preparing an extrudate comprising cultivated animal cells, a plant protein, at least one other ingredient, and optionally, a peptide cross-linking enzyme, the method comprising the steps of:

a) loading dry plant protein, and optionally loading a dry at least one other ingredient and/or dry peptide-cross linking enzyme into the hopper of an extrusion machine to prepare a dry ingredient mixture;

b) placing the dry ingredient mixture into the barrel of the extrusion machine;

c) preparing a dough in the barrel by injecting steam or water into the barrel;

d) conveying the dough through the barrel under mechanical pressure, optionally heating the dough in the barrel;

e) injecting cultivated animal cells into the barrel during conveyance of the dough to prepare dough/cell admixture; and

f) extruding the dough/cell admixture through a die to produce the extrudate.

45. The method of any one of claims 42 to 44, wherein the heating of the dough or the dough/cell admixture is performed by injecting steam into the barrel or by heating the barrel.

46. The method of any one of claims 42 to 45 wherein the extrusion method is a wet extrusion method or a dry extrusion method.

47. The method of any one of claims 42 to 46, wherein the extrusion machine is a single screw extrusion machine or a twin screw extrusion machine.

48. The method of any of claims 43 to 47, wherein the peptide cross-linking enzyme is contacted with the dough or the dough/cell admixture.

49. The method of any of claims 43 to 48, wherein the cultivated animal cells are frozen or dried.

50. The method of any one of claims 42 to 49, wherein the cultivated animal cells are cultivated in a suspension culture or an adherent culture.

~~51. The method of any one of claims 42 to 50, wherein the cultivated animal cells are cultivated in a growth medium that comprises animal serum.~~

~~52. The method of any one of claims 42 to 50, wherein the cultivated animal cells are cultivated in a growth medium that does not comprise animal serum.~~

~~53. A wet cell paste comprising cultivated animal cells, wherein when the cell density of the wet cell paste is between 1 x 10^6 to 10 x 10^6 cells per ml, at a temperature of between 30° Cand 95° C, the storage modulus (G′) is between 5 Pa and 300 Pa.~~

~~54. The wet cell paste of claim 53, wherein the cultivated animal cell is an avian cell, a bovine cell, a porcine cell, or a seafood cell.~~

~~55. The wet cell paste of any one of claims 53 to 54, wherein the avian cell is selected from the group consisting of chicken cells, turkey cells, duck cells, goose cells, pheasant cells and squab cells.~~

~~56. The wet cell paste of any one of claims 53 to 55, wherein the cultivated animal cell is of the genus *Gallus Meleagris, Anas, Bos* or *Sus.*~~

~~57. The wet cell paste of any one of claims 53 to 56, wherein the avian cell is of the genus *Gallus.*~~

~~58. The wet cell paste of any one of claims 53 to 56, wherein the avian cell is of the genus *Bos.*~~

~~59. The wet cell paste of any one of claims 53 to 58, wherein the wet cell paste has a gelation temperature of between 35° and 95° C.~~

~~60. The wet cell paste of any one of claims 53 to 58, wherein the wet cell paste has a gelation temperature of between 40° and 95° C.~~

~~61. The wet cell paste of any one of claims 53 to 58, wherein the wet cell paste has a gelation temperature of between 45° and 95° C.~~

~~62. The wet cell paste of any one of claims 53 to 58, wherein the wet cell paste has a gelation temperature of between 50° and 95° C.~~

~~63. The wet cell paste of any one of claims 53 to 58, wherein the wet cell paste has a gelation temperature of between 50° and 85° C.~~

~~64. The wet cell paste of any one of claims 53 to 58, wherein the wet cell paste has a gelation temperature of between 50° and 75° C.~~

~~65. The wet cell paste of any one of claims 53 to 58, wherein the wet cell paste has a gelation temperature of between 50° and 70° C.~~

~~66. The wet cell paste of any one of claims 53 to 58, wherein the wet cell paste has a gelation temperature of between 50° and 65° C.~~

~~67. The wet cell paste of any one of claims 53 to 58, wherein the wet cell paste has a gelation temperature of between 50° and 60° C.~~