CLAIMS:

1. A 3D printed meat slab analogue comprising a 3D printed protein-based component and a fat-based component;

wherein when dividing the meat slab analogue into segments, it comprises at least one segment that consists essentially of the protein-based component which is chemically distinct from at least one other segment of the slab and that consists essentially of the fat-based component;

wherein the meat slab analogue comprises layers of substantially aligned strands of the protein based component;

wherein the meat slab analogue comprises at least one layer that comprises, separately distributed therein, a fat based component and a protein based component;

wherein a cubic sample of the meat slab analogue exhibits an anisotropic physical property when said physical parameter is measured from three different essentially orthogonal directions of the cubic sample; and

wherein the dimensions of the meat slab analogue are sufficient to permit slicing therefrom of individual steak slices having a thickness of between 0.5cm to 10cm, when said slicing is in a direction essentially perpendicular to the direction of the strands o~~p~~f the protein based component.

2. A 3D printed meat slab analogue comprising a 3D printed protein-based component and a fat-based component;

wherein when dividing the meat slab analogue into segments, it comprises at least one segment that consists essentially of the protein-based component which is chemically distinct from at least one other segment that consists essentially of the fat-based component;

wherein the meat slab analogue comprises layers of substantially aligned strands of the protein based component;

wherein the meat slab analogue comprises at least one layer that comprises, separately distributed therein, a fat based component and a protein based component;

wherein the meat slab analogue comprises a non-homogenous distribution of the protein-based component and the fat-based component; and

wherein the dimensions of the meat slab analogue are sufficient to permit slicing therefrom of individual steak slices having a thickness of between 0.5cm to 10cm, when said slicing is in a direction essentially perpendicular to the direction of the strands of the protein based component.

3. The meat slab analogue of claim 1, comprising a non-homogenous distribution of the protein-based component and the fat-based component.

4. The meat slab analogue of any one of claims 1 to 3, wherein a wet sample of a segment of the protein-based component comprises between 5w% to 60w% protein material.

5. The meat slab analogue of any one of claims 1 to 4, wherein the fat-based component is characterized by at least one of (i) it has a viscosity at 30ºC of between 3,000 and 1,000,000 centipoise (cP); (ii) it has a melting point temperature in the range of 30ºC to 80ºC.

6. The meat slab analogue of claim 5, wherein said fat based component has a viscosity at 30ºC of between 10,000 and 300,000 centipoise.

7. The meat slab analogue of any one of claims 1 to 6, comprising two or more protein-based components that are different in their protein content.

8. The meat slab analogue of any one of claim 1 to 7, comprising two or more fat-based components that are different in their fat content.

9. The meat slab analogue of any one of claims 1 to 8, wherein a wet sample of a segment of the fat-based component comprises between 20w% to 100w% lipophilic matter.

10. The meat slab analogue of claim 9, wherein a wet sample of a segment of the fat-based component comprises between 60w% to 100w% lipophilic matter.

11. The meat slab analogue of any one of claims 1 to 10, wherein said fat-based component comprises unsaturated fatty acids.

12. The meat slab analogue of any one of claims 1 to 10, wherein said fat-based component comprises any one or combination of saturated fatty acids, unsaturated fatty acids, oleogels, water in oil emulsion, oil in water emulsion and oil-in oil emulsion.

13. The meat slab analogue of any one of claims 1 to 12, wherein said anisotropic physical property is a textural property.

14. The meat slab analogue of any one of claims 1 to 12, wherein said anisotropic physical property is exhibited in value difference of at least 20% when said physical property is measured in at least one sample of at least 0.5cc, at three orthogonal directions.

15. The meat slab analogue of any one of claims 1 to 14, comprising an aqueous-based component.

16. The meat slab analogue of claim 15, wherein said aqueous-based component comprises an amount of water between 70w% to 97w% when extracted from a sample of at least 0.5cc of said meat analogue.

17. The meat slab analogue of claim 15, wherein a sample of at least 0.5cc comprises 30% to 80% water, when averaged over at least 10 such samples.

18. The meat slab analogue of any one of claims 1 to 17, comprising a bonding agent.

19. The meat slab analogue of claim 18, wherein said bonding agent comprises any one or combination of gluten, cross-linking enzyme, cross-linked gelling agent, hydrocolloids, and gums.

20. The meat slab analogue of claim 19, wherein said cross linking enzyme is an enzyme catalyzing the formation of any one or combination of disulfide bonds and isopeptide bonds.

21. The meat slab analogue of claim 19 wherein said enzyme is transglutaminase.

22. The meat analogue of claim 19, wherein at least a portion of the hydrocolloid is present in segments comprising the protein based component.

23. The meat slab analogue of claim 19, wherein the cross-linked gelling agent forms cross-linked calcium alginate.

24. The meat slab analogue of any one of claims 1 to 23, being defined by a width, height and length, and having a length between 10cm to 50cm, a height of between 10cm to 15cm and a width of between 12cm to 20cm.

25. The meat slab analogue of any one of claims 1 to 23, being defined by a width, height and length, and having a length between 30cm to 100cm, a height of between 15cm to 30cm and a width of between 20cm to 40cm.

26. The meat slab analogue of any one of claims 1 to 25, wherein said protein based component comprises texturized vegetable proteins (TVP).

27. The meat slab analogue of any one of claims 1 to 26, comprising substantially aligned stands fat component.

28. A method for producing a meat slab analogue according to any one of claims 1 to 25, the method comprises printing layers comprising one or both of protein-based component and a fat-based component,

wherein said printing is configured to provide

one or more segments comprising the protein-based component which is chemically distinct from other segments comprising the fat-based components;

layers comprising strands of the protein based component that are substantially aligned with printing direction of the meat slab analogue;

at least one layer with, separately distributed therein, a fat based component and a protein based component;

an anisotropic physical property in a cubic sample of the meat slab analogue, when said physical parameter is measured from three different directions of the cubic sample; and

dimensions of the meat slab analogue that are sufficient to permit slicing therefrom of individual steak slices of between 0.5cm to 10cm wide, when said slicing is in a direction essentially perpendicular to the direction of the strands of the protein based component.

29. A method for producing a meat slab analogue according to any one of claims 1 to 25, the method comprises printing layers comprising one or both of protein-based component and a fat-based component,

wherein said printing is configured to provide

one or more segments comprising the protein-based component which is chemically distinct from other segments comprising the fat-based components;

layers comprising strands of the protein based component that are substantially aligned with printing direction of the meat slab analogue;

at least one layer with, separately distributed therein, a fat based component and a protein based component;

a non-homogenous distribution of the protein-based component and the fat-based component within the meat slab analogue; and

dimensions of the meat slab analogue that are sufficient to permit slicing therefrom of individual steak slices of between 0.5cm to 10cm wide, when said slicing is in a direction essentially perpendicular to the direction of the strands of the protein based component.

30. The method of claim 29, wherein said printing is configured to provide an anisotropic physical property in a cubic sample of the meat slab analogue.

31. The method of any one of claim 29 to 30, wherein said printing is according to a pre-defined assembly plan defining spatial arrangement of the protein-based component and the fat based component one with respect to the other.

32. The method of any one of claims 29 to 31, comprising printing strands of the protein-based component.

33. The method of any one of claims 29 to 32, comprising printing strands of the fat-based component.

34. The method of any one of claims 29 to 33, comprising texturizing the protein-based component prior to depositing strands of the protein-based component onto a printing bed.

35. The method of any one of claims 29 to 34, comprising at least one curing stage, said curing comprises any one or combination of

- applying a bonding agent;
- applying a texturizing agent
- exposure to infra-red (IR) radiation;
- exposure to ultraviolet (UV) radiation;
- heating or cooling;

- removing or introducing moisture (rehydration or dehydration).

36. The method of any one of claims 29 to 35, comprising applying the bonding agent between one or more printed layers.

37. The method of any one of claims 29 to 36, comprising printing at least three layers.

38. The method of claim 37, wherein at least two of said at least three layer are non-identical.

39. The method of any one of claims 29 to 38, comprising printing layers to obtain a meat slab analogue having a length between 10cm to 50cm, a height of between 10cm to 15cm and a width of between 12cm to 20cm.

40. The method of any one of claims 29 to 39, comprising printing layers to obtain a meat slab analogue having a length between 30cm to 100cm, a height of between 15cm to 30cm and a width of between 20cm to 40cm.