WHAT IS CLAIMED IS:

1. ~~1.~~ A ~~method of making~~system for growing an edible aerial mycelium, comprising:

~~providing~~ a growth matrix comprising a substrate and a fungal inoculum, wherein the fungal inoculum comprises a fungus;

~~incubating~~a growth environment configured to incubate the growth matrix as a solid-state culture ~~in a growth environment~~ for an incubation time period;

a misting apparatus; and

~~introducing~~an atmospheric control system with an electronic controller configured to maintain a carbon dioxide (CO_2) level within the growth environment between at least about 0.02% (v/v) and less than about 8% (v/v) and to introduce aqueous mist into the growth environment with the misting apparatus throughout the incubation time period, or a portion thereof, ~~wherein the aqueous mist has~~at a mist deposition rate and a mean mist deposition rate, wherein the ~~mean mist deposition rate is less than or equal to about 10 microliter/cm^2/hour; thereby producing extra-particle aerial mycelial growth from the growth matrix.~~

~~2. The method of claim 1, wherein:~~

~~the growth environment comprises a growth atmosphere having a relative humidity, an oxygen (O_2) level and a carbon dioxide (CO_2) level, wherein the CO_2 level is at least about 0.02% (v/v) and is less than about 8% (v/v);~~

~~the~~ mist deposition rate is less than or equal to about 150 microliter/cm^2/hour~~;~~, and the mean mist deposition rate is less than or equal to about ~~5~~3 microliter/cm^2/hour.

~~3.~~ The ~~method of claim 1 or 2, further comprising removing the extra-particle aerial mycelial growth from the growth matrix, thereby providing an edible aerial mycelium.~~

~~4. The method of claim 3~~system of claim 1, wherein the ~~aerial mycelium~~atmospheric control system is ~~an edible aerial mycelium that does not contain a visible fruiting body.~~

~~4.~~2. ~~The method of any one of the preceding claims, wherein introducing aqueous mist into~~configured to maintain the growth environment ~~comprises introducing the aqueous mist into the growth environment throughout the incubation time period.~~at a relative humidity of at least about 95%.

3. The system of claim 1 or 2, wherein the atmospheric control system is configured to maintain the growth environment at a temperature within a range of 55° F to 100° F.

4. The system of any one of claims 1 to 3, wherein the atmospheric control system is configured to maintain the ratio of the mist deposition rate to the mean mist deposition rate within a range of about 100:1 to about 1000:1.

~~6.~~5. The ~~method~~system of any one of claims 1 to 4, wherein ~~introducing aqueous mist comprises introducing~~ the aqueous mist ~~into the growth environment throughout a portion of the incubation time period, wherein the portion of the incubation time period comprises a mycelial vertical expansion phase~~comprises one or more solutes.

~~7.~~6. The ~~method~~system of any one of ~~the preceding~~ claims 1 to 5, wherein ~~introducing the aqueous mist into the growth environment comprises depositing~~the misting apparatus is configured to deposit the aqueous mist onto the growth matrix, the extra-particle aerial mycelial growth, or both.

7. ~~8.~~ The ~~method~~system of any one of ~~the preceding~~ claims 1 to 6, wherein the ~~mist deposition rate~~system is ~~less than about 50 microliter/cm^2/hour, or is less than about 25 microliter/cm^2/hour~~configured to provide a substantially horizontal airflow across the growth matrix.

8. The ~~method~~system of claim ~~8~~7, wherein the ~~mist deposition rate is less than~~substantially horizontal airflow has a velocity of no greater than about 275 linear feet per minute.

9. The system of any one of claims 1 to 8, wherein the atmospheric control system is configured to maintain an O_2 level within the growth environment between a range of about 14% to about ~~10 microliter/cm^2/hour.~~21% (v/v).

10. The ~~method~~system of any one of ~~the preceding~~ claims 1 to 9, wherein the CO_2 level is within a range of about 0.2% ~~(v/v)~~ to about 7% (v/v).

~~11. The method of any one of the preceding claims, wherein the CO_2 level is at least about 2% (v/v).~~

~~12.~~11. ~~The method~~system of any one of claims ~~claim~~ 1 to 10, wherein the ~~CO_2 level~~fungus is ~~less than about 3% (v/v).~~a filamentous fungus.

~~13. The method of any one of the preceding claims, wherein the O_2 level is within a range of about 14% (v/v) to about 21% (v/v).~~

~~14. The method~~The system of any one of ~~the preceding claims, wherein the relative humidity is at least about 95%, is at least about 96%, is at least about 97%, is at least about 98%, is at least about 99%, or is about 100%.~~

~~15. The method of any one of the preceding claims, wherein the incubation time period is up to about 3 weeks.~~

~~16. The method of claim 15, wherein the incubation time period is within a range of about 4 days to about 17 days.~~

~~17. The method of any one of the preceding claims, wherein introducing aqueous mist comprises introducing aqueous mist into the growth environment throughout a portion of the incubation time period, wherein the portion of the incubation time period begins during a second day, a third day or a fourth day of the incubation time period.~~

~~18. The method of any one of the preceding claims, wherein introducing aqueous mist excludes introducing the aqueous mist into the growth environment during a primary myceliation phase.~~

~~19.~~12. ~~The method of any one of the preceding claims~~claims 1 to 11, wherein the growth environment is a dark environment.

13. The ~~method~~system of any one of ~~the preceding~~ claims 1 to 12, wherein the ~~growth environment has~~substrate is a ~~temperature within a range~~natural substrate.

14. The system of ~~about 55 °F to about 100 °F, or within a range~~claim 13, wherein the natural substrate comprises a lignocellulosic material.

15. The system of ~~about 60 °F~~claim 13, wherein the natural substrate comprises a cellulosic material.

16. The system of claim 15, wherein the cellulosic material is a lignin-free material.

17. The system of claim 13, wherein the natural substrate comprises an inorganic material.

18. The system of claim 17, wherein the inorganic material comprises a mineral-based material.

19. The system of any one of claims 1 to ~~about 95 °F~~18, wherein the fungal inoculum produces mycelium.

20. The system of claim 19, wherein the mycelium does not include any visible stipe, cap or spores.

~~21. The method~~system of claim 19 or 20, wherein the ~~growth environment temperature is within a range of about 60 °F to about 75 °F, is within a range of about 65 °F to about 75 °F, or is within a range of about 65 °F to about 70 °F.~~

~~22. The method of any one of the preceding claims, wherein the growth environment further comprises an airflow.~~

~~23. The method of any one of the preceding claims, further comprising directing~~mycelium grows vertically to produce an ~~airflow through the growth environment.~~

~~24. The method of claim 22 or 23, wherein the airflow is a substantially horizontal airflow.~~

~~25. The method of claim 24, wherein the substantially horizontal airflow has a velocity of no greater than about 125 linear feet per minute, has a velocity of no greater than about 110 linear feet per minute, has a velocity of no greater than about 100 linear feet per minute, or has a velocity of no greater than about 90 linear feet per minute.~~

~~26. The method of any one of the preceding claims, wherein the mist deposition rate is less than about 5 microliter/cm^2/hour, is less than about 4 microliter/cm^2/hour, is less than about 3 microliter/cm^2/hour, is less than about 2 microliter/cm^2/hour, or is less than about 1 microliter/cm^2/hour.~~

~~27. The method of any one of the preceding claims, wherein the mean mist deposition rate is less than or equal to about 3 microliter/cm^2/hour.~~

~~28. The method of any one of the preceding claims, wherein the mist deposition rate is less than about 2 microliter/cm^2/hour, the mean mist deposition rate is less than or equal to about 1 microliter/cm^2/hour, or both.~~

~~29. The method of any one of the preceding claims, wherein the mean mist deposition rate is at least about 0.01 microliter/cm^2/hour.~~

~~30. The method of any one of the preceding claims, wherein the mist deposition rate is less than about 1 microliter/cm^2/hour, the mean mist deposition rate is less than or equal to about 0.8 microliter/cm^2/hour, or both.~~

~~31. The method of any one of the preceding claims, wherein the mist deposition rate is at most about 10-fold greater than the mean mist deposition rate, is at most about 5-fold greater than the mean mist deposition rate, or is at most about 4-fold greater than the mean mist deposition rate.~~

~~32. The method of any one of the preceding claims, wherein the fungus is not a fungus of the genus Ganoderma.~~

33. The method of any one of the preceding claims, wherein the fungus is an edible species of the genus *Agrocybe, Albatrellus, Amillaria, Agaricus, Bondarzewia, Cantharellus, Cerioporus, Climacodon, Cordyceps, Fistulina, Flammulina, Fomes, Fomitopsis, Fusarium, Grifola, Herecium, Hydnum, Hypomyces, Hypsizygus, Ischnoderma, Laetiporus, Laricifomes, Lentinula, Lentinus, Lepista, Meripilus, Morchella, Ophiocordyceps, Panellus, Piptoporus, Pleurotus, Polyporus, Pycnoporellus, Rhizopus, Schizophyllum, Stropharia, Tuber, Tyromyces or Wolfiporia.*

34. The method of claim 33, wherein the fungus is an edible species of the genus *Flammulina*, *Lentinula, Morchella* or *Pleurotus.*

35. The method of any one of the preceding claims, wherein the fungus is a species of the genus *Pleurotus.*

36. The method of claim 35, wherein the fungus is *Pleurotus citrinopilleatus, Pleurotus columbinus, Pleurotus cornucopiae, Pleurotus dryinus, Pleurotus djamor, Pleurotus eryngii, Pleurotus floridanus, Pleurotus ostreatus, Pleurotus populinus, Pleurotus pulmonarius, Pleurotus sajor-caju* or *Pleurotus tuber-regium.*

37. The method of claim 35 or 36, wherein the fungus is *Pleurotus ostreatus*.

38. The method of any one of the preceding claims, wherein the aqueous mist comprises one or more solutes.

39. The method of claim 38, wherein the solute is an additive.

40. The method of any one of the preceding claims, wherein the substrate is a lignocellulosic substrate.

41. The method of any one of the preceding claims, wherein the growth matrix comprises a nutrient source, wherein the nutrient source is different than the substrate.

42. The method of any one of the preceding claims, wherein the aqueous mist has a conductivity of no greater than about 1,000 microsiemens/cm, has a conductivity of no greater than about 800 microsiemens/cm, has a conductivity of no greater than about 500 microsiemens/cm, has a conductivity of no greater than about 100 microsiemens/cm, or has a conductivity of no greater than about 50 microsiemens/cm.

43. The method of any one of the preceding claims, wherein the aqueous mist has a conductivity of no greater than about 25 microsiemens/cm, has a conductivity of no greater than about 10 microsiemens/cm, has a conductivity of no greater than about

~~5 microsiemens/cm, or has a conductivity of no greater than about 3 microsiemens/cm.~~

~~44.~~21. ~~The method of any one of claims 2 to 43, wherein removing the extra particle~~ aerial mycelium ~~from the growth matrix comprises removing the extra particle aerial mycelium from the growth matrix as a single contiguous object~~.

~~45.~~22. The ~~method~~system of claim ~~44~~21, wherein the ~~single contiguous object comprises~~aerial mycelium has a ~~contiguous volume.~~mean density of at least 1 pound per cubic food (pcf).

~~46.~~ The ~~method~~system of claim ~~44~~21 or ~~45~~22, wherein the ~~single contiguous object is characterized as having a contiguous volume of at least about 15 cubic inches.~~

~~47. The method of claim 46, wherein the single contiguous object is characterized as having a contiguous volume of at least about 150 cubic inches, or at least about 300 cubic inches.~~

~~48. The method of any one of claims 44 to 47, wherein the single contiguous object is characterized as having a series of linked hyphae over the contiguous volume.~~

~~49.~~23. ~~The method of any one of the preceding claims, wherein the edible~~ aerial mycelium has a mean ~~native~~ thickness of at least ~~about 20 mm, at least about 30 mm, at least about 40 mm or at least about 50 mm~~15 millimeters.

~~50. The method of any one of the preceding claims, wherein the edible aerial mycelium has a moisture content of at least about 80% (w/w).~~

~~51. The method of any one of the preceding claims, wherein the method further comprises drying the aerial mycelium to provide a dried aerial mycelium having a moisture content of no greater than about 10% (v/v).~~

~~52. An edible aerial mycelium obtained from a method of any one of the preceding claims.~~

~~53. The edible aerial mycelium of claim 52, wherein the edible aerial mycelium is suitable for use in the manufacture of a food product.~~

~~54. The edible aerial mycelium of claim 52, wherein the edible aerial mycelium is for use in the manufacture of a food product.~~

~~55. The edible aerial mycelium of claim 53 or 54, wherein the food product is a mycelium-based food product.~~

~~56. The edible aerial mycelium of claim 55, wherein the mycelium-based food product is a whole muscle meat alternative.~~

57. The edible aerial mycelium of claim 55 or 56, wherein the mycelium-based food product is a mycelium-based bacon product.

58. The edible aerial mycelium of claim 52, wherein the edible aerial mycelium is a food ingredient.

59. The edible aerial mycelium of any one of claims 52 to 58, wherein the aerial mycelium has a mean native density of no greater than about 70 pcf, no greater than about 50 pcf, no greater than about 45 pcf, no greater than about 40 pcf, no greater than about 35 pcf, no greater than about 30 pcf, no greater than about 25 pcf, no greater than about 20 pcf or no greater than about 15 pcf.

60. The edible aerial mycelium of any one of claims 52 to 59, wherein the edible aerial mycelium has a mean native density of at least about 1 pound per cubic foot (pcf).

61. An edible aerial mycelium, wherein the edible aerial mycelium comprises a grain, and wherein the edible aerial mycelium is characterized as having at least two of the following properties:

i. a mean native density of no greater than about 70 pounds per cubic foot (pcf);

ii. a native moisture content of at least about 80% (w/w);

iii. a native Kramer shear force of no greater than about 5 kg/g;

iv. a native ultimate tensile strength of no greater than about 5 psi;

v. a native ultimate tensile strength in a dimension substantially parallel to the grain and a native ultimate tensile strength in a dimension substantially perpendicular to the grain, wherein the native ultimate tensile strength in the dimension substantially parallel to the grain is not more than about 5-fold greater than the native ultimate tensile strength in the dimension substantially perpendicular to the grain;

vi. a native compressive modulus at 10% strain of no greater than about 10 psi;

vii. a native compressive modulus at 10% strain in a dimension substantially parallel to the grain and a native compressive modulus at 10% strain in a dimension substantially perpendicular to the grain, wherein the native compressive modulus at 10% strain in the dimension substantially parallel to the grain is not more than about 20-fold greater than the native compressive modulus at 10% strain in the dimension substantially perpendicular to the grain;

viii. a native compressive stress at 65% strain upon compression in a direction substantially perpendicular to the grain of no greater than about 10 psi;

ix. a mean native thickness of at least about 20 mm;

wherein the edible aerial mycelium does not contain a fruiting body.

62. The edible aerial mycelium of claim 61, wherein the edible aerial mycelium is characterized as having at least three of said properties.

63. The edible aerial mycelium of claim 61, wherein the edible aerial mycelium is characterized as having at least four of said properties.

64. The edible aerial mycelium of claim 61, wherein the edible aerial mycelium is characterized as having at least five of said properties.

65. The edible aerial mycelium of claim 61, wherein the edible aerial mycelium is characterized as having at least six of said properties.

66. The edible aerial mycelium of claim 61, wherein the edible aerial mycelium is characterized as having at least seven of said properties.

67. The edible aerial mycelium of claim 61, wherein the edible aerial mycelium is characterized as having at least eight of said properties.

68. The edible aerial mycelium of claim 61, wherein the edible aerial mycelium is characterized as having all nine of said properties.

69. The edible aerial mycelium of any one of claims 61 to 68, wherein the edible aerial mycelium has a mean native density of at least about 1 pcf.

70. The edible aerial mycelium of any one of claims 61 to 69, wherein the edible aerial mycelium has a native moisture content of at least about 85% (w/w), or at least about 90% (w/w).

71. The edible aerial mycelium of any one of claims 61 to 70, wherein the edible aerial mycelium has a native Kramer shear force of no greater than about 3 kg/g.

72. The edible aerial mycelium of any one of claims 61 to 71, wherein the edible aerial mycelium has a native ultimate tensile strength of no greater than about 3 psi.

73. The edible aerial mycelium of any one of claims 61 to 72, wherein the edible aerial mycelium has a native compressive modulus at 10% strain of no greater than about 5 psi.

74. The edible aerial mycelium of any one of claims 61 to 73, wherein the native compressive modulus at 10% strain in the dimension substantially parallel to the grain is not more than about 10-fold greater than the native compressive modulus at 10% strain in the dimension substantially perpendicular to the grain.

75. The edible aerial mycelium of any one of claims 61 to 74, wherein the native compressive modulus at 10% strain in the dimension substantially parallel to the

grain is at least about 2-fold greater than the native compressive modulus at 10% strain in the dimension substantially perpendicular to the grain.

76. The edible aerial mycelium of any one of claims 61 to 75, wherein the native compressive stress at 65% strain upon compression in a direction substantially perpendicular to the grain is no greater than about 1 psi, or no greater than about 0.5 psi.

77. The edible aerial mycelium of any one of claims 61 to 76, wherein the edible aerial mycelium has a mean native density of at least about 2 pcf.

78. The edible aerial mycelium of any one of claims 61 to 77, wherein the edible aerial mycelium has a mean native density of no greater than about 50 pcf, no greater than about 45 pcf, no greater than about 40 pcf, no greater than about 35 pcf or no greater than about 30 pcf.

79. The edible aerial mycelium of any one of claims 61 to 78, wherein the edible aerial mycelium has a mean native density of no greater than about 25 pcf, no greater than about 20 pcf or no greater than about 15 pcf.

80. The edible aerial mycelium of any one of claims 61 to 79, wherein the edible aerial mycelium has a mean native thickness of at least about 30 mm, at least about 40 m or at least about 50 mm.

81. The edible aerial mycelium of any one of claims 61 to 80, wherein the edible aerial mycelium has a median native thickness of at least about 30 mm, at least about 40 mm, or at least about 50 mm.

82. The edible aerial mycelium of any one of claims 61 to 81, wherein the edible aerial mycelium is a growth product of an edible fungus.

83. The edible aerial mycelium of claim 82, wherein the edible fungus is a species of the genus *Agrocybe, Albatrellus, Amillaria, Agaricus, Bondarzewia, Cantharellus, Cerioporus, Climacodon, Cordyceps, Fistulina, Flammulina, Fomes, Fomitopsis, Fusarium, Grifola, Herecium, Hydnum, Hypomyces, Hypsizygus, Ischnoderma, Laetiporus, Laricifomes, Lentinula, Lentinus, Lepista, Meripilus, Morchella, Ophiocordyceps, Panellus, Piptoporus, Pleurotus, Polyporus, Pycnoporellus, Rhizopus, Schizophyllum, Stropharia, Trametes, Tuber, Tyromyces* or *Wolfiporia.*

84. The edible aerial mycelium of claim 83, wherein the edible fungus is *Pleurotus citrinopilleatus, Pleurotus columbinus, Pleurotus cornucopiae, Pleurotus dryinus, Pleurotus djamor, Pleurotus eryngii, Pleurotus floridanus, Pleurotus ostreatus,*

~~*Pleurotus populinus*, *Pleurotus pulmonarius*, *Pleurotus sajor-caju* or *Pleurotus tuber-regium*.~~

~~85. The edible aerial mycelium of claim 84, wherein the edible fungus is *Pleurotus ostreatus*.~~

~~86. The edible aerial mycelium of any one of claims 61 to 81, wherein the edible aerial mycelium is not a growth product of a fungus of the genus *Ganoderma*.~~

~~87. The edible aerial mycelium of any one of claims 61 to 86, wherein the edible aerial mycelium has a native protein content within a range of about 20% to about 50% (w/w) on a dry weight basis.~~

~~88. The edible aerial mycelium of any one of claims 61 to 87, wherein the edible aerial mycelium has a native potassium content of at least about 4000 mg per 100 grams of dry aerial mycelium.~~

~~89. The edible aerial mycelium of claim 88, wherein the native potassium content is within a range of about 4000 mg to about 7000 mg potassium per 100g dry aerial mycelium.~~

~~90. The edible aerial mycelium of any one of claims 61 to 89, wherein the edible aerial mycelium has a native fat content of at most about 7% (w/w) on a dry weight basis.~~

~~91. The edible aerial mycelium of any one of claims 61 to 90, wherein the edible aerial mycelium has a native carbohydrate content within a range of about 30% (w/w) to about 60% (w/w) on a dry weight basis.~~

~~92. The edible aerial mycelium of any one of claims 61 to 91, wherein the edible aerial mycelium has a native inorganic content within a range of about 5% (w/w) to about 20% (w/w) on a dry weight basis.~~

~~93. The edible aerial mycelium of any one of claims 61 to 92, wherein the edible aerial mycelium has a native dietary fiber content within a range of about 15% (w/w) to about 35% (w/w) on a dry weight basis.~~

~~94. The edible aerial mycelium of any one of claims 61 to 93, wherein the edible aerial mycelium has an open volume of at least about 50% (v/v), at least about 60% (v/v) or at least about 70% (v/v).~~

~~95. The edible aerial mycelium of any one of claims 61 to 94, wherein the edible aerial mycelium has a mean hyphal width of at most about 20 microns, at most about 15 microns, or within a range of about 0.2 to about 15 microns.~~

96. The edible aerial mycelium of any one of claims 61 to 95, wherein the edible aerial mycelium is suitable for use in the manufacture of a food product.

97. The edible aerial mycelium of any one of claims 61 to 95, wherein the edible aerial mycelium is for use in the manufacture of a food product.

98. The edible aerial mycelium of claim 96 or 97, wherein the food product is a mycelium-based food product.

99. The edible aerial mycelium of claim 98, wherein the mycelium-based food product is a whole muscle meat alternative.

100. The edible aerial mycelium of claim 98 or 99, wherein the mycelium-based food product is a mycelium-based bacon product.

101. An edible product comprising an edible aerial mycelium of any one of claims 61 to 95.

102. The edible product of claim 101, wherein the edible product further comprises one or more additives.

103. The edible product of claim 102, wherein the additive is a fat, a protein, an amino acid, a flavorant, an aromatic agent, a mineral, a vitamin, a micronutrient, a colorant or a preservative; or a combination thereof.

104. The edible product of claim 103, wherein the fat is almond oil, animal fat, avocado oil, butter, canola oil, coconut oil, corn oil, grapeseed oil, hempseed oil, lard, mustard oil, olive oil, palm oil, peanut oil, rice bran oil, safflower oil, soybean oil, sunflower seed oil, vegetable oil, or vegetable shortening; or a combination thereof.

105. The edible product of claim 104, wherein the fat is a plant-based oil or fat.

106. The edible product of claim 105, wherein the plant-based oil is coconut oil or avocado oil.

107. The edible product of claim 103, wherein the flavorant is a smoke flavorant, umami, maple, a salt, a sweetener, a spice, or a meat flavor; or a combination thereof.

108. The edible product of claim 107, wherein the smoke flavorant is applewood flavor, hickory flavor, liquid smoke flavor; or a combination thereof.

109. The edible product of claim 107, wherein the salt is sodium chloride, table salt, flaked salt, sea salt, rock salt, kosher salt or Himalayan salt; or a combination thereof.

110. The edible product of claim 107, wherein the sweetener is sugar, cane sugar, brown sugar, honey, molasses, juice, nectar, or syrup; or a combination thereof.

111. The edible product of claim 107, wherein the spice is paprika, pepper, mustard, garlic, chili, jalapeno or capsaicin; or a combination thereof.

112. The edible product of claim 103, wherein the colorant is beet extract, beet juice, or paprika; or a combination thereof.

113. The edible product of any one of claims 101 to 112, wherein the product contains substantially no amount of an artificial preservative.

114. The edible product of any one of claims 101 to 113, wherein the product contains substantially no amount of an artificial colorant.

115. The edible product of any one of claims 101 to 114, wherein the edible product is not a ground or minced product.

116. The edible product of any one of claims 101 to 115, wherein the edible product is not an extruded product.

117. The edible product of any one of claims 101 to 116, wherein the edible product is a food product.

118. The edible product of claim 117, wherein the food product is a mycelium-based food product.

119. The edible product of claim 118, wherein the mycelium-based food product is a whole muscle meat alternative.

120. The edible product of claim 118 or 119, wherein the mycelium-based food product is a mycelium-based bacon product.

121. A method of processing an edible aerial mycelium, comprising:

providing a panel comprising an edible aerial mycelium, wherein the edible aerial mycelium comprises a grain;

compressing at least a portion of the panel; and

cutting at least a portion of the panel in a direction substantially parallel to the grain.

122. The method of claim 121, wherein cutting comprises cutting the panel to form at least one panel section.

123. The method of claim 121 or 122, wherein cutting comprises cutting at least one of the panel and the panel section to form at least one strip.

~~124. The method of any one of claims 121 to 123, wherein compressing comprises compressing at least one of the panel, the at least one panel section, and the at least one strip in a second direction which is substantially non-parallel with respect to the grain.~~

~~125. The method of claim 124, wherein the substantially non-parallel direction is within a range of 45 degrees to 135 degrees with respect to the grain.~~

~~126. The method of claim 125, wherein the substantially non-parallel direction is within a range of about 70 degrees to about 110 degrees with respect to the grain.~~

~~127. The method of claim 126, wherein the substantially non-parallel direction is substantially orthogonal to the grain.~~

~~128. The method of any one of claims 121 to 127, wherein compressing comprises compressing at least one of the panel, the at least one section and the at least one strip, to about 15% to about 75% of the original panel length or width.~~

~~129. The method of claim 128, wherein compressing comprises compressing at least one of the panel, the at least one section and the at least one strip, to about 30 to about 40% of the original panel length or width.~~

~~130. The method of any one of claims 121 to 129, wherein the compressing comprises at least one compressing step that occurs before at least one cutting step of the cutting.~~

~~131. The method of any one of claims 121 to 130, wherein the cutting comprises at least one cutting step that occurs before the at least one compressing step of the compressing.~~

~~132. The method of any one of claims 121 to 130, wherein:~~

~~compressing comprises compressing the panel to form a compressed panel; and~~

~~cutting comprises cutting the compressed panel to form at least one compressed strip.~~

~~133. The method of any one of claims 121 to 130, wherein:~~

~~compressing comprises compressing the panel to form a compressed panel; and~~

~~cutting comprises:~~

~~first cutting the compressed panel to form at least one compressed section; and then cutting the at least one compressed section to form at least one compressed strip.~~

~~134. The method of any one of claims 121 to 131, wherein:~~

~~cutting comprises first cutting the panel to form at least one strip; and~~

~~compressing comprises compressing the at least one strip to form at least one compressed strip.~~

~~135. The method of any one of claims 121 to 132, wherein:~~

~~cutting comprises cutting the panel to form at least one section;~~

~~compressing comprises compressing the at least one section to form at least one compressed section; and~~

~~cutting further comprises cutting the at least one compressed section to form at least one compressed strip.~~

~~136. The method of any one of claims 121 to 132 and 135, wherein:~~

~~cutting comprises first cutting the panel to form at least one section, then cutting the at least one section to form at least one strip; and compressing the at least one strip.~~

~~137. The method of any one of claims 121 to 136, wherein the compressing comprises applying force to the panel, to the at least one section or to the at least one strip.~~

~~138. The method of any one of claims 121 to 137, wherein the compressing comprises constraining the panel, the at least one section or the at least one strip during said compression.~~

~~139. The method of any one of claims 121 to 138, wherein each said panel, at least one section and at least one strip has a volume, and wherein compressing comprises reducing said volume by applying the force to the panel, to the at least one section or to the at least one strip.~~

~~140. The method of claim 138 or 139, wherein constraining the panel comprises constraining the panel, the at least one section or the at least one strip from movement in a first dimension that is substantially perpendicular to the grain, and further constraining the panel, the at least one section or the at least one strip from movement in a second dimension that is both substantially parallel to the grain and substantially perpendicular to the second direction.~~

~~141. The method of any one of claims 121 to 140, wherein compressing comprises applying a force that is less than the force required to shear the panel, the section or the strip.~~

~~142. The method of any one of claims 121 to 141, wherein compressing the panel, the at least one section or the at least one strip forms a compressed panel, at least one compressed section or at least one compressed strip, respectively, each having a compressive stress at 65% strain of less than about 10 psi.~~

143. The method of any of claims 121 to 142, further comprising perforating at least one of the panel, the compressed panel, the section, the compressed section, the strip and the compressed strip.

144. The method of claim 143, wherein perforating comprises needling.

145. The method of claim 144, wherein needling comprise inserting at least one needle into the outer surface of the panel, the compressed panel, the section, the compressed section, the strip or the compressed strip.

146. The method of claim 145, wherein the at least one needle is straight or barbed.

147. The method of claim 145 or 146, wherein needling comprises inserting the at least one needle through an entire thickness of the panel, the compressed panel, the at least one section, the at least one compressed section, the at least one strip or the at least one compressed strip.

148. The method of any one of claims 143 to 147, wherein the at least one strip comprises a plurality of strips stacked relative to each other.

149. The method of any one of claims 143 to 148, wherein perforating the at least one strip comprises a first perforation step forming a first perforation pattern, and a second perforation step forming a second perforation pattern.

150. The method of claim 149, wherein at least one of the density, intensity and shape of the first perforation pattern is different from the density, intensity and shape of the second perforation pattern.

151. The method of any one of claims 121 to 150, wherein the at least one strip is a plurality of strips.

152. The method of claim 143, wherein the cutting, the compressing and the perforating occurs simultaneously.

153. The method of claim 143, wherein the following steps are performed in the following sequence: the compressing, then the cutting, then the perforating.

154. The method of claim 143, wherein the following steps are performed in the following sequence: the compressing, then the perforating, then the cutting.

155. The method of claim 143, wherein the following steps are performed in the following sequence: the cutting, then the compressing, then the perforating.

156. The method of any of claims 121 to 155, further comprising at least one of pan frying and baking.

157. The method of claim 156, wherein the at least one of pan frying and baking comprises a temperature within a range of about 275 ºF to about 400 ºF.

158. The method of any of claims 121 to 157, further comprising incorporating at least one additive into at least one of the panel, the at least one section, and the at least one strip.

159. The method of claim 158, wherein the at least one additive is a fat, a protein, an amino acid, a flavorant, an aromatic agent, a mineral, a vitamin, a micronutrient, a colorant or a preservative; or a combination thereof.

160. The method of any one of claims 121 to 159, wherein the at least one strip is at least one edible mycelium-based bacon strip.

161. A method of processing an edible aerial mycelium, comprising:

(a) providing a panel comprising an edible aerial mycelium, wherein the edible aerial mycelium is characterized as having a direction of mycelial growth along a first axis;

(b) performing a physical method comprising:

compressing the panel in a compressing direction which is substantially non-parallel with respect to the first axis to form a compressed panel;

optionally, sectioning the compressed panel to form at least one compressed section;

cutting the compressed panel, or optionally the at least one compressed section, in a cutting direction which is substantially parallel to the first axis to form at least one compressed strip; and

optionally, perforating the at least one compressed strip to form at least one perforated strip;

(c) boiling the at least one compressed strip, or optionally the at least one perforated strip, in a first aqueous saline solution to form at least one boiled strip;

(d) brining the at least one boiled strip to provide at least one brined strip;

(e) drying the at least one brined strip to provide at least one dried strip; and

(f) adding fat to the at least one dried strip to provide at least one fattened strip.

162. The method of claim 161, wherein the compressing comprises compressing the panel to about 15% to about 75% of the original panel length or width.

163. The method of claim 162, wherein the compressing comprises compressing the panel to about 30% to about 40% of the original panel length or width.

~~164. The method of any one of claims 161 to 163, wherein the compressing direction is within a range of greater than 45 degrees and less than 135 degrees, or greater than about 70 degrees and less than about 110 degrees, with respect to the first axis.~~

~~165. The method of any one of claims 161 to 163, wherein the compressing direction is substantially orthogonal to the first axis.~~

~~166. The method of any one of claims 161 to 165, wherein the cutting direction is within a range of plus or minus about 45 degrees with respect to the first axis, or is within a range of plus or minus about 30 degrees with respect to the first axis.~~

~~167. The method of any one of claims 161 to 166, wherein the method further comprises sectioning the compressed panel to form at least one compressed section.~~

~~168. The method of claim 167, wherein the sectioning comprises cutting the panel in the cutting direction to form the at least one compressed section.~~

~~169. The method of any of claims 161 to 168, wherein the physical method comprises perforating the at least one compressed strip to form the at least one perforated strip.~~

~~170. The method of any one of claims 161 to 169, wherein the first aqueous saline solution has a salt concentration within a range of about 0.1% (w/w) to about 26% (w/w), about 0.1% to about 15% (w/w), about 0.5% to about 10% (w/w), about 0.5% to about 5% (w/w) or about 1% to about 3%.~~

~~171. The method of any one of claims 161 to 170, wherein the first aqueous saline solution further comprises at least one an additive.~~

~~172. The method of any one of claims 161 to 171, wherein the brining comprises treating the at least one boiled strip with a brine fluid to provide the at least one brined strip.~~

~~173. The method of claim 172, wherein the brine fluid is a second aqueous saline solution having a salt concentration within a range of about 0.1% (w/w) to about 26% (w/w), about 0.1% to about 15% (w/w), about 0.5% to about 10% (w/w), about 0.5% to about 5% (w/w) or about 1% to about 3%.~~

~~174. The method of claim 172 or 173, wherein the brine fluid further comprises at least one additive.~~

~~175. The method of claim 174, wherein the at least one additive is a flavorant, a colorant, or both.~~

~~176. The method of any one of claims 172 to 175, wherein the brine fluid comprises a smoke flavorant, umami, maple, a salt, a sweetener, a spice, or a combination of any two or more of the foregoing.~~

177. The method of any one of claims 161 to 176, wherein the drying comprises heating the at least one brined strip.

178. The method of any one of claims 161 to 176, wherein the method further comprises cooling the at least one fattened strip.

179. The method of claim 178, wherein the cooling comprises cooling the at least one fattened strip until the fat is solidified.

180. The method of claim 178 or 179, wherein the method provides at least one finished edible strip.

181. The method of any one of claims 161 to 180, wherein each said at least one strip is a plurality of strips.

182. The method of any one of claims 161 to 181, wherein the at least one strip is at least one edible mycelium-based bacon strip.

183. The method of any one of claims 121 to 182, wherein the edible aerial mycelium is the edible aerial mycelium of any one of claims 61 to 95.

184. The method of any one of claims 121 to 183, further comprising packaging the at least one strip.

185. A batch of edible aerial mycelial panels, wherein each edible aerial mycelial panel in the batch comprises a grain, and wherein greater than 50% of the panels in the batch is characterized as having at least two of the following properties:

x. a mean native density of no greater than about 70 pounds per cubic foot (pcf);

xi. a native moisture content of at least about 80% (w/w);

xii. a native Kramer shear force of no greater than about 5 kg/g;

xiii. a native ultimate tensile strength of no greater than about 5 psi;

xiv. a native ultimate tensile strength in a dimension substantially parallel to the grain and a native ultimate tensile strength in a dimension substantially perpendicular to the grain, wherein the native ultimate tensile strength in the dimension substantially parallel to the grain is not more than about 5-fold greater than the native ultimate tensile strength in the dimension substantially perpendicular to the grain;

xv. a native compressive modulus at 10% strain of no greater than about 10 psi;

xvi. a native compressive modulus at 10% strain in a dimension substantially parallel to the grain and a native compressive modulus at 10% strain in a dimension substantially perpendicular to the grain, wherein the native compressive modulus at 10% strain in the dimension substantially parallel to the grain is not more than

about 20-fold greater than the native compressive modulus at 10% strain in the dimension substantially perpendicular to the grain;

xvii. a native compressive stress at 65% strain upon compression in a direction substantially perpendicular to the grain of no greater than about 10 psi;

xviii. a mean native thickness of at least about 20 mm;

wherein the edible aerial mycelium does not contain a fruiting body.

186. A batch of edible aerial mycelial panels, wherein greater than 50% of the panels in the batch is an edible aerial mycelium according to any one of claims 61 to 95.

187. The batch of edible aerial mycelial panels of claim 185 or 186, wherein greater than 50% of the panels in the batch are suitable for use in the manufacture of a food product.

188. The batch of edible aerial mycelial panels of claim 185 or 186, wherein greater than 50% of the panels in the batch are for use in the manufacture of a food product.

189. The batch of edible aerial mycelial panels of claim 188, wherein the food product is a mycelium-based food product.

190. The batch of edible aerial mycelial panels of claim 188, wherein the mycelium-based food product is a whole muscle meat alternative or a mycelium-based bacon product.

191. An edible strip of mycelium-based bacon comprising:

a strip of edible aerial mycelium, wherein the edible aerial mycelium is the edible aerial mycelium of any one of claims 61 to 95, and wherein the strip of edible aerial mycelium contains at least one additive.

192. The edible strip of mycelium-based bacon of claim 191, wherein the strip of edible aerial mycelium is a brined strip.

193. The edible strip of mycelium-based bacon of claim 191 or 192, wherein the strip of edible aerial mycelium is a brined, fatted strip.

194. The edible strip of mycelium-based bacon of claim 191, 192 or 193, wherein the strip of edible aerial mycelium is a boiled, brined and fatted strip.

195. The edible strip of mycelium-based bacon of any one of claims 191 to 194, wherein the strip of edible aerial mycelium is a boiled, brined, compressed and fatted strip.

196. The edible strip of mycelium-based bacon of claims 191 to 195, wherein the strip of edible aerial mycelium is a boiled, brined, compressed, perforated and fatted strip.

197. The edible strip of mycelium-based bacon of claim 191, wherein the strip is the at least one finished edible strip of claim 180.

198. The edible strip of mycelium-based bacon of any one of claim 191 to 197, wherein the edible strip has a moisture content within a range of about 10% to about 90% (w/w).

199. The edible strip of mycelium-based bacon of any one of claims 191 to 198, wherein the at least one additive comprises a flavorant, a colorant, a fat, or a combination thereof.

200. The edible strip of mycelium-based bacon of claim 199, wherein the at least one additive is coconut oil, sugar, salt, natural flavors and beet juice.

201. The edible strip of mycelium-based bacon of any one of claims 191 to 200, wherein the strip has a length within a range of about 6 to about 10 inches, a width within a range of about 1 to about 2 inches, and a height of no greater than about 0.25 inches.

202. The edible strip of mycelium-based bacon of any one of claims 191 to 201, characterized as having a nutritional content comprising:

a fat content within a range of about 5% (w/w) to about 15% (w/w);

a total carbohydrate content within a range of about 5% to about 20% (w/w); and

a protein content within a range of about 3% to about 15% (w/w).

203. The edible strip of mycelium-based bacon of claim 202, wherein the total carbohydrate content includes about 50% (w/w) dietary fiber.

204. The edible strip of mycelium-based bacon of claim 202 or 203, further comprising potassium in an amount within a range of about 0.1% and about 1% (w/w).

205. The edible strip of mycelium-based bacon of claim 202, 203 or 204, further comprising sodium in an amount within a range of about 0.5% and about 2% (w/w).

206. The edible strip of mycelium-based bacon of any one of claims 202 to 205, further characterized as containing substantially no amount of cholesterol.

207. The edible strip of mycelium-based bacon of any one of claims 202 to 206, comprising sodium in an amount of about 1% (w/w); total carbohydrate in an

~~amount of about 10% to about 15% (w/w); protein in an amount of about 4% to about 7% (w/w); and potassium within a range of about 0.1% to about 0.5% (w/w).~~

~~208. The edible strip of mycelium-based bacon of any one of claims 191 to 207, wherein the edible aerial mycelium is *Pleurotus* mycelium.~~

~~209. The edible strip of mycelium-based bacon of claim 208, wherein the edible aerial mycelium is *Pleurotus ostreatus* mycelium.~~

~~210. The edible strip of mycelium-based bacon of any one of claims 191 to 209, wherein the strip of mycelium-based bacon is not a ground, minced or extruded strip of mycelium-based bacon.~~

~~211. A packaged mycelium-based bacon product, comprising:~~

~~a package, comprising:~~

~~at least one edible strip of any one of claims 191 to 210; and~~

~~a label, wherein the label comprises nutritional information and cooking instructions for said mycelium-based bacon product.~~

~~212. The packaged mycelium-based bacon product of claim 211, wherein the at least one edible strip is a plurality of strips.~~