sealing layer to retain internal moisture and provide a substantially hermetic barrier while avoiding colonization by microbes, while still retaining a desired texture.

SUMMARY

In one example of the present disclosure, a method for preparing a food product comprises (a) contacting a filamentous fungal biomass with a solution; (b) size-reducing the filamentous fungal biomass to form a plurality of filamentous fungal pieces; and (c) treating the plurality of filamentous fungal pieces to form the food product. Steps (a) and (b) may be performed simultaneously or sequentially in any order.

In examples, the solution may comprise at least one of sodium chloride, a food seasoning, an edible protein, and a fibrous base material.

In examples, a mass of the solution may be between about 1% and about 30% of a mass of the filamentous fungal biomass prior to contacting the solution.

In examples, step (a) may be carried out under sub-atmospheric pressure. The sub-atmospheric pressure may, but need not, be a pressure of between about zero and about 101.325 kilopascals, or no more than about 0.1 pascals.

In examples, step (a) may be carried out under a reduced-oxygen and/or nitrogen-enriched atmosphere.

In examples, step (a) may comprise the sub-step of removing water from the filamentous fungal biomass.

In examples, step (a) may be carried out by agitating the filamentous fungal biomass together with the solution.

In examples, the filamentous fungal biomass may absorb or otherwise take up an amount of the solution equal to at least about 5 wt%, at least about 10 wt%, at least about 15 wt%, at least about 20 wt%, at least about 25 wt%, or at least about 30 wt% of the total (*i.e.*, "wet" or prior to dehydration/removal of water) weight of the filamentous fungal biomass.

In examples, step (a) may comprise contacting at least two filamentous fungal biomasses with the solution; the method may further comprise, between steps (a) and (b), aggregating the at least two filamentous fungal biomasses to form a filamentous fungal aggregate; and step (b) may comprise size-reducing the filamentous fungal aggregate. The aggregate may, but need not, comprise a casing that encases the at least two filamentous fungal biomasses. The aggregating step may, but need not, be carried out under sub-atmospheric pressure, which may, but need not, be a pressure of no more than about 0.1

pascals. The aggregating step may, but need not, comprise crust-freezing the at least two filamentous fungal biomasses.

In examples, step (b) may comprise at least one of cutting, shredding, and shaving the filamentous fungal biomass. The plurality of filamentous fungal pieces may, but need not, comprise at least one of strips, shreds, and shavings of the filamentous fungal biomass.

In examples, at least one of an average length, an average width, and an average depth of the plurality of filamentous fungal pieces may be between about 0.5 mm and about 1.0 mm.

In examples, step (c) may comprise at least one of roasting the plurality of filamentous fungal pieces, baking the plurality of filamentous fungal pieces, boiling the plurality of filamentous fungal pieces, frying the plurality of filamentous fungal pieces, steaming the plurality of filamentous fungal pieces, cold-smoking the plurality of filamentous fungal pieces, and hot-smoking the plurality of filamentous fungal pieces.

In examples, the solution may be an aqueous solution.

In examples, the solution may be a non-aqueous solution.

In another example of the present disclosure, a method for preparing a food product comprises (a) contacting a filamentous fungal biomass with a solution; and (b) dehydrating the filamentous fungal biomass.

In examples, the food product may be a meat jerky analog food product.

In examples, the solution may comprise at least one of sodium chloride, a food seasoning, and an edible protein.

In examples, a mass of the solution may be between about 1% and about 30% of a mass of the filamentous fungal biomass prior to contacting the solution.

In examples, step (a) may be carried out under sub-atmospheric pressure. The sub-atmospheric pressure may, but need not, be a pressure of no more than about 0.1 pascals.

In examples, step (a) may comprise the sub-step of removing water from the filamentous fungal biomass.

In examples, step (a) may be carried out by agitating the filamentous fungal biomass together with the solution.

In examples, the filamentous fungal biomass may absorb or otherwise take up at least about 5 wt%, at least about 10 wt%, at least about 15 wt%, at least about 20 wt%, at least about 25 wt%, or at least about 30 wt% of the solution.

In examples, the solution may be an aqueous solution.

In examples, the solution may be a non-aqueous solution.

In another example of the present disclosure, a method for preparing a food product comprises (a) contacting a first filamentous fungal biomass, or portion thereof, with a first solution; (b) size-reducing the first filamentous fungal biomass, or portion thereof, to form a plurality of filamentous fungal pieces; (c) contacting a second filamentous fungal biomass, or portion thereof, with a second solution; (d) combining the plurality of filamentous fungal pieces and the second filamentous fungal biomass, or portion thereof; and I treating the plurality of filamentous fungal pieces and the second filamentous fungal biomass, or portion thereof, to form the food product.

In examples, the food product may be a meat jerky analog food product.

In examples, at least one of the first and second solutions may comprise at least one of sodium chloride, a food seasoning, and an edible protein.

In examples, at least one of the following may be true: (i) a mass of the first solution is between about 1% and about 30% of a mass of the first filamentous fungal biomass, or portion thereof, prior to step (a); and (ii) a mass of the second solution is between about 1% and about 30% of a mass of the second filamentous fungal biomass, or portion thereof, prior to step (c).

In examples, at least one of step (a) and step (c) may be carried out under sub-atmospheric pressure. The sub-atmospheric pressure may, but need not, be a pressure of no more than about 0.1 pascals.

In examples, at least one of the following may be true: (i) step (a) comprises the sub-step of removing water from the first filamentous fungal biomass, or portion thereof; and (ii) step (c) comprises the sub-step of removing water from the second filamentous fungal biomass, or portion thereof.

In examples, at least one of the following may be true: (i) step (a) is carried out by agitating the first filamentous fungal biomass, or portion thereof, together with the first solution; and (ii) step (c) is carried out by agitating the second filamentous fungal biomass, or portion thereof, together with the second solution.

In examples, at least one of the following may be true: (i) the first filamentous fungal biomass, or portion thereof, absorbs or otherwise takes up at least about 5 wt%, at least about 10 wt%, at least about 15 wt%, at least about 20 wt%, at least about 25 wt%, or at least about 30 wt% of the first solution; and (ii) the second filamentous fungal biomass, or portion thereof, absorbs or otherwise takes up at least about 5 wt%, at least about 10 wt%,

at least about 15 wt%, at least about 20 wt%, at least about 25 wt%, or at least about 30 wt% of the second solution.

In examples, at least one of the first and second solutions may be an aqueous solution.

In examples, at least one of the first and second solutions may be a non-aqueous solution.

In another example of the present disclosure, a meat jerky analog food product is made according to a method as described herein.

In examples, the meat jerky analog food product may have a water activity of between about 0.35 and about 0.85, or less than about 0.45.

In examples, the meat jerky analog food product may have a shelf life of at least about two weeks, at least about three weeks, at least about one month, at least about two months, at least about three months, at least about four months, at least about five months, at least about six months, at least about seven months, at least about eight months, at least about nine months, at least about ten months, at least about eleven months, at least about twelve months, at least about fifteen months, at least about eighteen months, at least about 21 months, or at least about 24 months.

In another example of the present disclosure, an intermediate food composition comprises a filamentous fungal biomass or a portion thereof; and a solution, absorbed or otherwise taken up by the filamentous fungal biomass or portion thereof.

In examples, the solution may comprise at least one of sodium chloride, a food seasoning, and an edible protein.

In examples, a mass of the solution may be between about 1% and about 30% of a mass of the filamentous fungal biomass or portion thereof.

In examples, the solution may be an aqueous solution.

In examples, the solution may be a non-aqueous solution.

In another aspect of the present disclosure, a method for preparing a food product comprises (a) contacting a filamentous fungal biomass with a solution comprising a food additive; (b) size-reducing the filamentous fungal biomass to form a plurality of filamentous fungal pieces; and (c) removing at least a portion of a solvent of the solution to treat the plurality of filamentous fungal pieces to form the food product comprising the filamentous fungal pieces and the food additive, wherein steps (a) and (b) are carried out simultaneously or sequentially in any order.

In examples, the food additive may comprise at least one of sodium chloride, a food seasoning, an edible protein, and a fibrous base material.

In examples, a mass of the solution may be between about 1% and about 30% of a total mass of the filamentous fungal biomass prior to contacting the solution.

In examples, step (a) may be carried out under sub-atmospheric pressure. The sub-atmospheric pressure may, but need not, be a pressure of no more than about 0.1 pascals.

In examples, step (a) may be carried out under super-atmospheric pressure.

In examples, step (a) may be carried out at a temperature below room temperature. The temperature below room temperature may, but need not, be no more than about 40 °F.

In examples, during at least part of a duration of step (a), a temperature of the filamentous fungal biomass may be no more than about 34 °F.

In examples, the method may further comprise, prior to step (a), removing water from the filamentous fungal biomass.

In examples, step (a) may comprise agitating the filamentous fungal biomass together with the solution.

In examples, the filamentous fungal biomass may absorb an amount of the solution equal to at least about 5 wt%, at least about 10 wt%, at least about 15 wt%, at least about 20 wt%, at least about 25 wt%, or at least about 30 wt% of the weight of the filamentous fungal biomass.

In examples, step (a) may comprise contacting at least two filamentous fungal biomasses with the solution, wherein the method further comprises, between steps (a) and (b), aggregating the at least two filamentous fungal biomasses to form a filamentous fungal aggregate, and wherein step (b) comprises size-reducing the filamentous fungal aggregate. The step of aggregating may, but need not, comprise encasing the at least two filamentous fungal biomasses in a casing. The aggregating step may, but need not, be carried out under sub-atmospheric pressure, which may, but need not, be a pressure of no more than about 0.1 pascals. The aggregating step may, but need not, comprise crust-freezing the at least two filamentous fungal biomasses.

In examples, the method may further comprise, between steps (a) and (b), crust freezing the filamentous fungal biomass. An internal temperature of the filamentous fungal biomass after the crust freezing step may, but need not, be between about 25 °F and about 27 °F. The crust freezing step may, but need not, be carried out by placing the filamentous fungal biomass in a blast freezer.

In examples, step (b) may comprise at least one of cutting, shredding, and shaving the filamentous fungal biomass. The plurality of filamentous fungal pieces may, but need not, comprise at least one of strips, shreds, and shavings of the filamentous fungal biomass.

In examples, at least one of an average length, an average width, and an average depth of the plurality of filamentous fungal pieces may be between about 0.5 mm and about 1.0 mm.

In examples, step (c) may comprise at least one of roasting the plurality of filamentous fungal pieces, baking the plurality of filamentous fungal pieces, boiling the plurality of filamentous fungal pieces, frying the plurality of filamentous fungal pieces, steaming the plurality of filamentous fungal pieces, cold-smoking the plurality of filamentous fungal pieces, and hot-smoking the plurality of filamentous fungal pieces.

In examples, the solution may be an aqueous solution.

In examples, the solution may be a non-aqueous solution.

In examples, the method may further comprise, prior to step (a), forming the filamentous fungal biomass by a fermentation method comprising culturing a filamentous fungus in or on a fermentation medium or on a membrane associated with a fermentation medium; and inactivating the filamentous fungal biomass. The fermentation method may, but need not, be selected from the group consisting of a surface fermentation method, a submerged fermentation method, a membrane fermentation method, a solid-substrate fermentation method, and an air-medium colloid (AMC) fermentation method. The inactivating step may, but need not, be carried out by steaming the filamentous fungal biomass.

In examples, the food product may have a tensile strength of at least about 30 g/cm^2, at least about 40 g/cm^2, at least about 50 g/cm^2, at least about 60 g/cm^2, at least about 70 g/cm^2, at least about 80 g/cm^2, at least about 90 g/cm^2, at least about 100 g/cm^2, at least about 150 g/cm^2, at least about 200 g/cm^2, at least about 250 g/cm^2, at least about 300 g/cm^2, at least about 350 g/cm^2, at least about 400 g/cm^2, at least about 450 g/cm^2, at least about 500 g/cm^2, at least about 550 g/cm^2, at least about 600 g/cm^2, at least about 650 g/cm^2, at least about 700 g/cm^2, at least about 750 g/cm^2, at least about 800 g/cm^2, at least about 850 g/cm^2, at least about 900 g/cm^2, at least about 950 g/cm^2, at least about 1000 g/cm^2, at least about 1500 g/cm^2, at least about 2000 g/cm^2, at least about 2500 g/cm^2, at least about 3000 g/cm^2, at least about 3500 g/cm^2, or at least about 4000 g/cm^2.

In examples, the food product may comprise all essential amino acids.

In examples, the food product may comprise at least one amino acid selected from the group consisting of alanine, cysteine, aspartic acid, glutamic acid, glycine, asparagine, proline, glutamine, arginine, serine, selenocysteine, and tyrosine.

In examples, the food product may comprise at least about 10 wt%, at least about 15 wt%, at least about 20 wt%, at least about 25 wt%, or at least about 30 wt% branched-chain amino acids.

In examples, the food product may have a total fat content of less than about 30 wt%, less than about 25 wt%, less than about 20 wt%, less than about 19 wt%, less than about 18 wt%, less than about 17 wt%, less than about 16 wt%, less than about 15 wt%, less than about 14 wt%, less than about 13 wt%, less than about 12 wt%, less than about 11 wt%, less than about 10 wt%, less than about 9 wt%, less than about 8 wt%, less than about 7 wt%, less than about 6 wt%, or less than about 5 wt%.

In examples, the filamentous fungal biomass may comprise at least about 6 wt%, at least about 7 wt%, at least about 8 wt%, at least about 9 wt%, or at least about 10 wt% dietary fiber on a dry weight basis.

In examples, the food product may have a dietary fiber content of at least about 1 gram, at least about 2 grams, at least about 3 grams, at least about 4 grams, at least about 5 grams, at least about 6 grams, at least about 7 grams, at least about 8 grams, at least about 9 grams, at least about 10 grams, at least about 11 grams, at least about 12 grams, at least about 13 grams, or at least about 14 grams of dietary fiber per 28 grams of food composition.

In examples, the filamentous fungal biomass may comprise a filamentous fungal biomat or portion thereof.

In examples, the food product may have a total protein content from about 10 wt% to about 25 wt%.

In another aspect of the present disclosure, a meat analog food product is made according to a method as described herein.

In another aspect of the present disclosure, a method for preparing a food product comprises (a) contacting a filamentous fungal biomass with a solution comprising a food additive; and (b) dehydrating the filamentous fungal biomass to form the food product comprising the filamentous fungal biomass and the food additive dispersed within the filamentous fungal biomass.

In examples, the food product may be a meat jerky analog food product.

In examples, the solution may comprise at least one of sodium chloride, a food seasoning, an edible protein, and a fibrous base material.

In examples, a mass of the solution may be between about 1% and about 30% of a mass of the filamentous fungal biomass prior to contacting the solution.

In examples, step (a) may be carried out under sub-atmospheric pressure. The sub-atmospheric pressure may, but need not, be a pressure of no more than about 0.1 pascals.

In examples, step (a) may be carried out at a temperature below room temperature. The temperature below room temperature may, but need not, be no more than about 40 °F.

In examples, step (a) may be carried out at a temperature above room temperature.

In examples, during at least part of a duration of step (a), a temperature of the filamentous fungal biomass may be no more than about 34 °F.

In examples, the method may further comprise, prior to step (a), removing water from the filamentous fungal biomass.

In examples, step (a) may be carried out by agitating the filamentous fungal biomass together with the solution.

In examples, the filamentous fungal biomass may absorb at least about 5 wt%, at least about 10 wt%, at least about 15 wt%, at least about 20 wt%, at least about 25 wt%, or at least about 30 wt% of the solution.

In examples, the solution may be an aqueous solution.

In examples, the solution may be a non-aqueous solution.

In examples, the method may further comprise, prior to step (a), forming the filamentous fungal biomass by a fermentation method comprising culturing a filamentous fungus in a fermentation medium; and inactivating the filamentous fungal biomass. The fermentation method may, but need not, be a surface fermentation method. The inactivating step may, but need not, be carried out by steaming the filamentous fungal biomass.

In examples, the food product may have a tensile strength of at least about 30 g/cm^2, at least about 40 g/cm^2, at least about 50 g/cm^2, at least about 60 g/cm^2, at least about 70 g/cm^2, at least about 80 g/cm^2, at least about 90 g/cm^2, at least about 100 g/cm^2, at least about 150 g/cm^2, at least about 200 g/cm^2, at least about 250 g/cm^2, at least about 300 g/cm^2, at least about 350 g/cm^2, at least about 400 g/cm^2, at least about 450 g/cm^2, at least about 500 g/cm^2, at least about 550 g/cm^2, at least about 600 g/cm^2, at least about 650 g/cm^2, at least about 700 g/cm^2, at least about 750 g/cm^2, at least about 800 g/cm^2, at least about 850 g/cm^2, at least about 900 g/cm^2, at least about 950 g/cm^2, at least about 1000 g/cm^2, at least

about 1500 g/cm^2, at least about 2000 g/cm^2, at least about 2500 g/cm^2, at least about 3000 g/cm^2, at least about 3500 g/cm^2, or at least about 4000 g/cm^2.

In examples, the food product may comprise all nine essential amino acids.

In examples, the food product may comprise at least one amino acid selected from the group consisting of alanine, cysteine, aspartic acid, glutamic acid, glycine, asparagine, proline, glutamine, arginine, serine, selenocysteine, and tyrosine.

In examples, the food product may comprise at least about 10 wt%, at least about 15 wt%, at least about 20 wt%, at least about 25 wt%, or at least about 30 wt% branched-chain amino acids.

In examples, the food product may have a total fat content of less than about 30 wt%, less than about 25 wt%, less than about 20 wt%, less than about 19 wt%, less than about 18 wt%, less than about 17 wt%, less than about 16 wt%, less than about 15 wt%, less than about 14 wt%, less than about 13 wt%, less than about 12 wt%, less than about 11 wt%, less than about 10 wt%, less than about 9 wt%, less than about 8 wt%, less than about 7 wt%, less than about 6 wt%, or less than about 5 wt%.

In examples, the filamentous fungal biomass may comprise at least about 6 wt%, at least about 7 wt%, at least about 8 wt%, at least about 9 wt%, or at least about 10 wt% dietary fiber on a dry weight basis.

In examples, the food product may have a dietary fiber content of at least about 1 gram, at least about 2 grams, at least about 3 grams, at least about 4 grams, at least about 5 grams, at least about 6 grams, at least about 7 grams, at least about 8 grams, at least about 9 grams, at least about 10 grams, at least about 11 grams, at least about 12 grams, at least about 13 grams, or at least about 14 grams of dietary fiber per 28 grams of food composition.

In examples, the filamentous fungal biomass may comprise a filamentous fungal biomat or a portion thereof.

In examples, the food product may have a total protein content from about 10 wt% to about 25 wt%.

In another aspect of the present disclosure, a meat jerky analog food product is made according to a method as disclosed herein.

In another aspect of the present disclosure, a meat analog food product comprises filamentous fungus, wherein the meat analog food product has a shelf life of at least about two weeks and wherein at least one of the following is true: (i) the meat analog food product comprises less than about 200 milligrams of sodium per 28 grams of food product; (ii) the meat analog food product comprises no more than 15 grams of sugar per 28 grams of food

product; and (iii) a sugar content of the meat analog food product is no more than about 10 wt%.

In examples, the meat analog food product may have a shelf life of at least about three weeks, at least about one month, at least about two months, at least about three months, at least about four months, at least about five months, at least about six months, at least about seven months, at least about eight months, at least about nine months, at least about ten months, at least about eleven months, at least about twelve months, at least about fifteen months, at least about eighteen months, at least about 21 months, or at least about 24 months.

In examples, the meat analog food product may have a water activity of between about 0.35 and about 0.85.

In examples, the meat analog food product may have a water activity of no more than about 0.45.

In examples, the meat analog food product may comprise less than about 190 milligrams, less than about 180 milligrams, less than about 170 milligrams, less than about 160 milligrams, less than about 150 milligrams, less than about 140 milligrams, less than about 130 milligrams, less than about 120 milligrams, less than about 110 milligrams, or less than about 100 milligrams of sodium per 28 grams of food product.

In examples, at least one of the following may be true: (i) the meat analog food product comprises no more than 14 grams, no more than 13 grams, no more than 12 grams, no more than 11 grams, no more than 10 grams, no more than 9 grams, no more than 8 grams, no more than 7 grams, no more than 6 grams, no more than 5 grams, no more than 4 grams, no more than 3 grams, no more than 2 grams, or no more than 1 gram of sugar per 28 grams of food product; and (ii) a sugar content of the meat analog food product is no more than about 9 wt%, no more than about 8 wt%, no more than about 7 wt%, no more than about 6 wt%, no more than about 5 wt%, no more than about 4 wt%, no more than about 3 wt%, no more than about 2 wt%, or no more than about 1 wt%.

In examples, the food product may have a tensile strength of at least about 30 g/cm^2, at least about 40 g/cm^2, at least about 50 g/cm^2, at least about 60 g/cm^2, at least about 70 g/cm^2, at least about 80 g/cm^2, at least about 90 g/cm^2, at least about 100 g/cm^2, at least about 150 g/cm^2, at least about 200 g/cm^2, at least about 250 g/cm^2, at least about 300 g/cm^2, at least about 350 g/cm^2, at least about 400 g/cm^2, at least about 450 g/cm^2, at least about 500 g/cm^2, at least about 550 g/cm^2, at least about 600 g/cm^2, at least about 650 g/cm^2, at least about 700 g/cm^2, at least about 750 g/cm^2, at least about 800 g/cm^2, at least about 850 g/cm^2, at least about 900 g/cm^2, at least about 950 g/cm^2, at least about 1000 g/cm^2, at least

about 1500 g/cm^2, at least about 2000 g/cm^2, at least about 2500 g/cm^2, at least about 3000 g/cm^2, at least about 3500 g/cm^2, or at least about 4000 g/cm^2.

In examples, the meat analog food product may comprise all nine essential amino acids.

In examples, the meat analog food product may comprise at least one amino acid selected from the group consisting of alanine, cysteine, aspartic acid, glutamic acid, glycine, asparagine, proline, glutamine, arginine, serine, selenocysteine, and tyrosine.

In examples, the meat analog food product may comprise at least about 10 wt%, at least about 15 wt%, at least about 20 wt%, at least about 25 wt%, or at least about 30 wt% branched-chain amino acids.

In examples, the meat analog food product may have a total fat content of less than about 30 wt%, less than about 25 wt%, less than about 20 wt%, less than about 19 wt%, less than about 18 wt%, less than about 17 wt%, less than about 16 wt%, less than about 15 wt%, less than about 14 wt%, less than about 13 wt%, less than about 12 wt%, less than about 11 wt%, less than about 10 wt%, less than about 9 wt%, less than about 8 wt%, less than about 7 wt%, less than about 6 wt%, or less than about 5 wt%.

In examples, the filamentous fungal biomass may comprise at least about 6 wt%, at least about 7 wt%, at least about 8 wt%, at least about 9 wt%, or at least about 10 wt% dietary fiber on a dry weight basis.

In examples, the meat analog food product may have a dietary fiber content of at least about 1 gram, at least about 2 grams, at least about 3 grams, at least about 4 grams, at least about 5 grams, at least about 6 grams, at least about 7 grams, at least about 8 grams, at least about 9 grams, at least about 10 grams, at least about 11 grams, at least about 12 grams, at least about 13 grams, or at least about 14 grams of dietary fiber per 28 grams of food composition.

In examples, the filamentous fungal biomass may comprise a filamentous fungal biomat or a portion thereof.

In examples, the meat analog food product may have a total protein content from about 10 wt% to about 25 wt%.

In another aspect of the present disclosure, a method for preparing a food product comprises (a) contacting a first filamentous fungal biomass with a first solution; (b) size-reducing the first filamentous fungal biomass to form a plurality of filamentous fungal pieces; (c) contacting a second filamentous fungal biomass with a second solution; (d) combining the plurality of filamentous fungal pieces and the second filamentous fungal

biomass; and (e) treating the plurality of filamentous fungal pieces and the second filamentous fungal biomass to form the food product.

In examples, the food product may be a meat jerky analog food product.

In examples, at least one of the first and second solutions may comprise at least one of sodium chloride, a food seasoning, an edible protein, and a fibrous base material.

In examples, at least one of the following may be true: (i) a mass of the first solution is between about 1% and about 30% of a mass of the first filamentous fungal biomass prior to step (a); and (ii) a mass of the second solution is between about 1% and about 30% of a mass of the second filamentous fungal biomass prior to step (c).

In examples, at least one of step (a) and step (c) is carried out under sub-atmospheric pressure. The sub-atmospheric pressure may, but need not, be a pressure of no more than about 0.1 pascals.

In examples, at least one of step (a) and step (c) may be carried out at a temperature below room temperature. The temperature below room temperature may, but need not, be no more than about 40 °F. During at least part of a duration of step (a), a temperature of at least one of the first filamentous fungal biomass and the second filamentous fungal biomass may, but need not, be no more than about 34 °F.

In examples, at least one of step (a) and step (c) may be carried out at a temperature above room temperature.

In examples, the method may further comprise at least one of: (i) prior to step (a), removing water from the first filamentous fungal biomass; and (ii) prior to step (c), removing water from the second filamentous fungal biomass.

In examples, at least one of the following may be true: (i) step (a) is carried out by agitating the first filamentous fungal biomass together with the first solution; and (ii) step (c) is carried out by agitating the second filamentous fungal biomass together with the second solution.

In examples, at least one of the following may be true: (i) the first filamentous fungal biomass absorbs at least about 5 wt%, at least about 10 wt%, at least about 15 wt%, at least about 20 wt%, at least about 25 wt%, or at least about 30 wt% of the first solution; and (ii) the second filamentous fungal biomass absorbs least about 5 wt%, at least about 10 wt%, at least about 15 wt%, at least about 20 wt%, at least about 25 wt%, or at least about 30 wt% of the second solution.

In examples, the method may further comprise at least one of (i) between steps (a) and (b), crust freezing the first filamentous fungal biomass, and (ii) between steps (c)

and (d), crust freezing the second filamentous fungal biomass. An internal temperature of the first filamentous fungal biomass when (i) is true, or an internal temperature of the second filamentous fungal biomass when (ii) is true, after the crust freezing step may, but need not, be between about 25 °F and about 27 °F. The crust freezing step may, but need not, be carried out by placing the filamentous fungal biomass in a blast freezer.

In examples, at least one of the first and second solutions may be an aqueous solution.

In examples, at least one of the first and second solutions may be a non-aqueous solution.

In examples, the method may further comprise, prior to at least one of steps (a) and (c), forming at least one of the filamentous fungal biomass and the second filamentous fungal biomass by a fermentation method comprising culturing a filamentous fungus in a fermentation medium; and inactivating the at least one of the first filamentous fungal biomass and the second filamentous fungal biomass. The fermentation method may, but need not, be a surface fermentation method. The inactivating step may, but need not, be carried out by at least one of dehydrating the filamentous fungal biomass, freezing the filamentous fungal biomass, pressure treating the filamentous fungal biomass, rinsing the filamentous fungal biomass, size reducing the filamentous fungal biomass, steaming the filamentous fungal biomass, and temperature cycling the filamentous fungal biomass.

In examples, the food product may have a tensile strength of at least about 30 g/cm^2, at least about 40 g/cm^2, at least about 50 g/cm^2, at least about 60 g/cm^2, at least about 70 g/cm^2, at least about 80 g/cm^2, at least about 90 g/cm^2, at least about 100 g/cm^2, at least about 150 g/cm^2, at least about 200 g/cm^2, at least about 250 g/cm^2, at least about 300 g/cm^2, at least about 350 g/cm^2, at least about 400 g/cm^2, at least about 450 g/cm^2, at least about 500 g/cm^2, at least about 550 g/cm^2, at least about 600 g/cm^2, at least about 650 g/cm^2, at least about 700 g/cm^2, at least about 750 g/cm^2, at least about 800 g/cm^2, at least about 850 g/cm^2, at least about 900 g/cm^2, at least about 950 g/cm^2, at least about 1000 g/cm^2, at least about 1500 g/cm^2, at least about 2000 g/cm^2, at least about 2500 g/cm^2, at least about 3000 g/cm^2, at least about 3500 g/cm^2, or at least about 4000 g/cm^2.

In examples, the food product may comprise all nine essential amino acids.

In examples, the food product may comprise at least one amino acid selected from the group consisting of alanine, cysteine, aspartic acid, glutamic acid, glycine, asparagine, proline, glutamine, arginine, serine, selenocysteine, and tyrosine.

In examples, the food product may comprise at least about 10 wt%, at least about 15 wt%, at least about 20 wt%, at least about 25 wt%, or at least about 30 wt% branched-chain amino acids.

In examples, the food product may have a total fat content of less than about 30 wt%, less than about 25 wt%, less than about 20 wt%, less than about 19 wt%, less than about 18 wt%, less than about 17 wt%, less than about 16 wt%, less than about 15 wt%, less than about 14 wt%, less than about 13 wt%, less than about 12 wt%, less than about 11 wt%, less than about 10 wt%, less than about 9 wt%, less than about 8 wt%, less than about 7 wt%, less than about 6 wt%, or less than about 5 wt%.

In examples, at least one of the filamentous fungal biomass and the second filamentous fungal biomass may comprise at least about 6 wt%, at least about 7 wt%, at least about 8 wt%, at least about 9 wt%, or at least about 10 wt% dietary fiber on a dry weight basis.

In examples, the food product may have a dietary fiber content of at least about 1 gram, at least about 2 grams, at least about 3 grams, at least about 4 grams, at least about 5 grams, at least about 6 grams, at least about 7 grams, at least about 8 grams, at least about 9 grams, at least about 10 grams, at least about 11 grams, at least about 12 grams, at least about 13 grams, or at least about 14 grams of dietary fiber per 28 grams of food composition.

In examples, at least one of the first filamentous fungal biomass and the second filamentous fungal biomass may comprise a filamentous fungal biomat or a portion thereof.

In examples, the food product may have a total protein content from about 10 wt% to about 25 wt%.

In another aspect of the present disclosure, a meat jerky analog food product is made according to a method as disclosed herein.

In another aspect of the present disclosure, an intermediate food composition comprises a filamentous fungal biomass; and a solution comprising a food additive, absorbed by the filamentous fungal biomass.

In examples, the solution may comprise at least one of sodium chloride, a food seasoning, an edible protein, and a fibrous base material.

In examples, a mass of the solution may be between about 1% and about 30% of a mass of the filamentous fungal biomass.

In examples, the solution may be an aqueous solution.

In examples, the solution may be a non-aqueous solution.

In examples, the filamentous fungal biomass may be derived from a fermentation method selected from the group consisting of a surface fermentation method, a submerged fermentation method, a membrane fermentation method, a solid-substrate fermentation method, an air-medium colloid (AMC) fermentation method, and combinations thereof.

In examples, the filamentous fungal biomass is inactivated.

In examples, the filamentous fungal biomass may comprise a filamentous fungal biomat or a portion thereof.

In another aspect of the present disclosure, a method for preparing a food product comprises (a) vacuum-shaping a filamentous fungal biomass, wherein the filamentous fungal biomass comprises a solution comprising a food additive; (b) size-reducing the vacuum-shaped filamentous fungal biomass to form a plurality of filamentous fungal pieces; and (c)removing at least a portion of a solvent of the solution to treat the plurality of filamentous fungal pieces to form the food product comprising the filamentous fungal pieces and the food additive.

In examples, in step (a), the filamentous fungal biomass may be exposed to an absolute pressure of no more than about 0.1 pascals.

In examples, following step (a), the filamentous fungal biomass may have an approximately cylindrical shape.

In examples, the method may further comprise, between steps (a) and (b), crust freezing the filamentous fungal biomass. An internal temperature of the filamentous fungal biomass after the crust freezing step may, but need not, be between about 25 °F and about 27 °F. The crust freezing step may, but need not, be carried out by placing the filamentous fungal biomass in a blast freezer.

In examples, step (b) may comprise at least one of cutting, shredding, and shaving the filamentous fungal biomass. The plurality of filamentous fungal pieces may, but need not, comprise at least one of strips, shreds, and shavings of the filamentous fungal biomass.

In examples, at least one of an average length, an average width, and an average depth of the plurality of filamentous fungal pieces may be between about 0.5 mm and about 1.0 mm.

In examples, the method may further comprise, prior to step (a), forming the filamentous fungal biomass by a fermentation method comprising culturing a filamentous fungus in a fermentation medium; and inactivating the filamentous fungal biomass. The

fermentation method may, but need not, be a surface fermentation method. The inactivating step may, but need not, be carried out by steaming the filamentous fungal biomass.

In examples, the food product may have a tensile strength of at least about 30 g/cm^2, at least about 40 g/cm^2, at least about 50 g/cm^2, at least about 60 g/cm^2, at least about 70 g/cm^2, at least about 80 g/cm^2, at least about 90 g/cm^2, at least about 100 g/cm^2, at least about 150 g/cm^2, at least about 200 g/cm^2, at least about 250 g/cm^2, at least about 300 g/cm^2, at least about 350 g/cm^2, at least about 400 g/cm^2, at least about 450 g/cm^2, at least about 500 g/cm^2, at least about 550 g/cm^2, at least about 600 g/cm^2, at least about 650 g/cm^2, at least about 700 g/cm^2, at least about 750 g/cm^2, at least about 800 g/cm^2, at least about 850 g/cm^2, at least about 900 g/cm^2, at least about 950 g/cm^2, at least about 1000 g/cm^2, at least about 1500 g/cm^2, at least about 2000 g/cm^2, at least about 2500 g/cm^2, at least about 3000 g/cm^2, at least about 3500 g/cm^2, or at least about 4000 g/cm^2.

In examples, the food product may comprise all nine essential amino acids.

In examples, the food product may comprise at least one amino acid selected from the group consisting of alanine, cysteine, aspartic acid, glutamic acid, glycine, asparagine, proline, glutamine, arginine, serine, selenocysteine, and tyrosine.

In examples, the food product may comprise at least about 10 wt%, at least about 15 wt%, at least about 20 wt%, at least about 25 wt%, or at least about 30 wt% branched-chain amino acids.

In examples, the food product may have a total fat content of less than about 30 wt%, less than about 25 wt%, less than about 20 wt%, less than about 19 wt%, less than about 18 wt%, less than about 17 wt%, less than about 16 wt%, less than about 15 wt%, less than about 14 wt%, less than about 13 wt%, less than about 12 wt%, less than about 11 wt%, less than about 10 wt%, less than about 9 wt%, less than about 8 wt%, less than about 7 wt%, less than about 6 wt%, or less than about 5 wt%.

In examples, the filamentous fungal biomass may comprise at least about 6 wt%, at least about 7 wt%, at least about 8 wt%, at least about 9 wt%, or at least about 10 wt% dietary fiber on a dry weight basis.

In examples, the food product may have a dietary fiber content of at least about 1 gram, at least about 2 grams, at least about 3 grams, at least about 4 grams, at least about 5 grams, at least about 6 grams, at least about 7 grams, at least about 8 grams, at least about 9 grams, at least about 10 grams, at least about 11 grams, at least about 12 grams, at least about 13 grams, or at least about 14 grams of dietary fiber per 28 grams of food composition.

In examples, the filamentous fungal biomass may comprise a filamentous fungal biomat or a portion thereof.

In examples, the food product may have a total protein content from about 10 wt% to about 25 wt%.

The advantages of the present disclosure will be apparent from the disclosure contained herein.

As used herein, "at least one," "one or more," and "and/or" are open-ended expressions that are both conjunctive and disjunctive in operation. For example, each of the expressions "at least one of A, B, and C," "at least one of A, B, or C," one or more of A, B, and C," "one or more of A, B, or C," and "A, B, and/or C" means A alone, B alone, C alone, A and B together, A and C together, B and C together, or A, B, and C together.

It is to be noted that the term "a" or "an" entity refers to one or more of that entity. As such, the terms "a" (or "an"), "one or more," and "at least one" can be used interchangeably herein. It is also to be noted that the terms "comprising," "including," and "having" can be used interchangeably.

As used herein, unless otherwise specified, the terms "about," "approximately," etc., when used in relation to numerical limitations or ranges, mean that the recited limitation or range may vary by up to 10%. By way of non-limiting example, "about 750" can mean as little as 675 or as much as 825, or any value therebetween. When used in relation to ratios or relationships between two or more numerical limitations or ranges, the terms "about," "approximately," etc. mean that each of the limitations or ranges may vary by up to 10%; by way of non-limiting example, a statement that two quantities are "approximately equal" can mean that a ratio between the two quantities is as little as 0.9:1.1 or as much as 1.1:0.9 (or any value therebetween), and a statement that a four-way ratio is "about 5:3:1:1" can mean that the first number in the ratio can be any value of at least 4.5 and no more than 5.5, the second number in the ratio can be any value of at least 2.7 and no more than 3.3, and so on.

The examples and configurations described herein are neither complete nor exhaustive. As will be appreciated, other examples of the disclosure are possible utilizing, alone or in combination, one or more of the features set forth above or described in detail below.