

CLAIMS

1. A method to prepare a myceliated high-protein food product, comprising the steps of:
 - providing an aqueous media comprising a high protein material, wherein the aqueous media comprises at least 50% protein on a dry weight basis,
 - inoculating the media with a fungal culture, wherein the fungal culture is selected from the group consisting of *Pleurotus ostreatus*, *Pleurotus eryngii*, *Lepista nuda*, *Hericium erinaceus*, *Lentinula edodes*, *Agaricus blazeii*, *Laetiporus sulfureus* and combinations thereof,
 - culturing the media to produce a myceliated high-protein food product; wherein the flavor or taste of the myceliated high-protein food product is modulated compared to the high protein material that is not myceliated.
2. The method of claim 1, wherein the fungal culture is *L. edodes*.
3. The method of any of claims 1-2, wherein the fungal culture is a submerged or stationary fungal culture.
4. The method of any of claims 1-3, wherein the aqueous media comprises at least 50 g/L protein.
5. The method of any of claims 1-4, wherein the aqueous media comprises at least 70 g/L protein.
6. The method of any of claims 1-5, wherein the high protein material is at least 70% protein on a dry weight basis.
7. The method of any of claims 1-6, wherein the high protein material is from a vegetarian source.

8. The method of claim 7, wherein the vegetarian source is pea, rice, hemp, cyanobacteria, grain, soy, or combinations thereof.
9. The method of claim 7, wherein the vegetarian source is pea, rice, or combinations thereof.
10. The method of any of claims 1-9, wherein the myceliated high-protein food product is pasteurized, sterilized, and/or dried.
11. The method of any of claims 1-10, wherein the flavor modulation is enhancing meaty flavors, enhancing umami taste, enhancing savory flavors, enhancing popcorn flavors, or enhancing mushroom flavors in the myceliated high-protein food product.
12. The method of any of claims 1-10, wherein the flavor modulation comprises deflavoring the material resulting in no to low aroma intensities in the myceliated high-protein food product, or reducing astringent flavors or reducing bitter flavors in the myceliated high-protein food product.
13. A myceliated food product made by any of the methods of claims 1-12.
14. A composition comprising a myceliated high-protein food product, wherein the myceliated high-protein food product is at least 50% (w/w) protein on a dry weight basis, wherein the myceliated high protein product contains mycelia from a fungal culture wherein the fungal culture is selected from the group consisting of *Pleurotus ostreatus*, *Pleurotus eryngii*, *Lepista nuda*, *Hericium erinaceus*, *Lentinula edodes*, *Agaricus blazeii*, *Laetiporus sulfureus* and combinations thereof.
15. The composition of claim 14, wherein the myceliated high-protein food product is at least 70% protein (w/w) on a dry weight basis.

16. The composition of any of claims 14-15, wherein the myceliated high-protein food product is derived from a vegetarian source.
17. The composition of claim 16, wherein the vegetarian source is pea, rice, or combinations thereof.
18. The composition of claim 14, wherein the fungal culture is *L. edodes*.