Claims

1. A process for producing single cell protein (SCP), the process comprising the steps of:

   a) growing a thermophilic fungus of the genus *Rhizomucor* in a medium containing a fermentable carbon-rich feedstock; wherein the fungus is grown in submerged culture under non-sterile conditions at a temperature higher than 45 °C and a pH of less than 3.8; and,

   b) recovery of SCP from the medium in the form of biomass of the thermophilic fungus grown in step a).

2. A process according to claim 1, wherein the concentration of the carbon-rich feedstock is below a concentration at which toxic compounds in the feedstock reduce the growth rate of the fungus.

3. A process according to claim 1 or 2, the carbon-rich feedstock is fed to the medium at a rate at which the concentration of the carbon-rich feedstock is kept below the concentration at which toxic compounds in the feedstock reduce the growth rate of the fungus, and wherein preferably the concentration at which toxic compounds in the feedstock reduce the growth rate of the fungus is defined as the highest concentration of the carbon-rich feedstock which does not cause a reduction in at least one of the rate of CO_2 production and the rate of O_2 consumption by the fungus.

4. A process according to any one of the preceding claims, wherein the carbon-rich feedstock in the medium is at a concentration of, or is fed to the medium at a rate to maintain a concentration of less than 5% (w/v) dry matter.

5. A process according to any one of the preceding claims, wherein the process comprises the use of two or more fermenters, wherein at least a first fermenter is emptied for harvesting and optionally cleaning, while in at least a second fermenter growth of the fungus continues, wherein preferably after harvesting and optional cleaning the empty first fermenter is filled with at least part of the content of the second fermenter wherein growth continued during harvesting and optional cleaning of the first fermenter.

6. A process according to any one of the preceding claims, wherein the process is a fed-batch process, a repeated fed-batch process or a continuous process, preferably a carbon-limited process.

7. A process according to any one of the preceding claims, wherein the thermophilic fungus is a strain of a fungal species *Rhizomucor miehei*, *Rhizomucor pusillus*, of which the strains *Rhizomucor miehei* CBS 143029, and *Rhizomucor pusillus* CBS 143028, are preferred, of which strain CBS 143028 is most preferred.

8. A process according to any one of the preceding claims, wherein the fermentable carbon-rich feedstock is one or more of a by-product or waste from agriculture or food production,

silage an organic fraction of municipal solid waste (MSW) and a product of plant origin that is compatible for food application, wherein preferably, the fermentable carbon-rich feedstock is one or more of sugar beet pulp, liquid C-starch from grain processing, vegetable waste from production of peeled, cut vegetables or rejected vegetables, Palm mill residues, including palm oil mill effluent (POME), empty fruit bunches (EFB) palm fronds, corn, potato, wheat, rice, cassava, sugar cane or sugar cane juice, sugar beet or sugar beet juice or thick juice, molasses, cane molasses, glucose syrups, fructose syrups and vegetable oils.

9. A process according to any one of the preceding claims, wherein the medium contains and/or is fed a nitrogen source, wherein preferably the nitrogen source comprises one or more of ammonia, urea and nitrate, wherein more preferably the nitrogen source is one or more of amines present in burden condensates obtained from evaporation of molasses, sugar beet or cane vinasses, vinasses from wine industry, grape residues, potato protein liquor (PPL), Corn steep liquor (CSL), ammonia from animal farm exhaust gas cleaning scrubbers, and the thin fraction of manure processing.

10. A process according to any one of the preceding claims, wherein the biomass is recovered from the medium by at least one of sieving, filtration and decantation, whereby preferably the dry matter concentration of the sieved, filtered or decantated biomass (cake) is at least 12% (w/v), and wherein more preferably, the biomass is recovered from the medium by at least one of rotating drum filtration, a filter press, a belt filter, a screen, a sieve, a sieve belt, a DSM screen, a belt press, a screw press and a decanter centrifuge, and whereby more preferably, the biomass cake can e.g. be further dried by pressing residual water out.

11. A process according to claim 10, wherein the water fraction that is obtained after sieving, filtering, decanting and/or further pressing the biomass (cake) is recycled back to the fermentation and/or used for further fermentation batches.

12. A process according to any one of claims 5 to 11, wherein the fermenter is operated without any cooling device that requires input energy.

13. A thermophilic fungal strain, wherein the strain is selected from the group consisting of the strains *Rhizomucor miehei* CBS 143029, and *Rhizomucor pusillus* CBS 143028.

14. An SCP product comprising protein from biomass of at least one thermophilic fungal strain selected from the group consisting of the strains *Rhizomucor miehei* CBS 143029, and *Rhizomucor pusillus* CBS 143028, of which strain CBS CBS 143028 is preferred, wherein preferably the protein in the biomass has a sum of total essential amino acids that is at least 10% higher than the sum of total essential amino acids in soybean protein, and wherein more preferably the protein in the biomass has at least one of a lysine contents of at least 8.5% of total amino acids.

15. A food or feed product comprising protein from biomass of at least one thermophilic fungal strain selected from the group consisting of the strains *Rhizomucor miehei* CBS 143029, and *Rhizomucor pusillus* CBS 143028, of which strain CBS 143028 is preferred.