WHAT IS CLAIMED:

1. A method of making a biomass of a microorganism having fatty acids and a concentration of EPA, comprising:

(a) fermenting the microorganism in a fermentor vessel to produce a biomass wherein the microorganism comprises a Thraustochytrid that produces a biomass having at least 3% EPA of the total weight of the fatty acids; and

(b) adjusting the amount of the biomass in the vessel to attain a desired EPA level in the biomass.

2. A method of making a biomass of a microorganism having fatty acids and a concentration of EPA, comprising:

(a) fermenting the microorganism in a fermentor vessel to produce a biomass wherein the microorganism comprises a Thraustochytrid that produces a biomass having at least 3% EPA of the total weight of the fatty acids; and

(b) adjusting the pressure on the biomass to attain a desired EPA level in the biomass.

3. A method of making a biomass of a microorganism having fatty acids and a concentration of EPA, comprising:

(a) fermenting the microorganism in a fermentor vessel to produce a fermentation broth and a biomass wherein the microorganism comprises a Thraustochytrid that produces a biomass having at least 3% EPA of the total weight of the fatty acids; and

(b) adjusting the temperature in the broth to attain a desired EPA level in the biomass.

4. A method of making a biomass of a microorganism having fatty acids and a concentration of EPA, comprising:

(a) fermenting the microorganism in a fermentor vessel, comprising a gas, to produce a biomass wherein the microorganism comprises a Thraustochytrid that produces a biomass having at least 3% EPA of the total weight of the fatty acids; and

(b) adjusting the CO_2 levels in the gas to attain a desired EPA level in the biomass.

5. A method of making a biomass of a microorganism having fatty acids and a concentration of EPA, comprising:

(a) fermenting the microorganism in a fermentor vessel to produce a fermentation broth having an aqueous phase and biomass wherein the aqueous phase has a dissolved gas wherein the microorganism comprises a Thraustochytrid that produces a biomass having at least 3% EPA of the total weight of the fatty acids; and

(b) adjusting the dissolved CO_2 to >2% of the dissolved gas.

6. The method as recited in any one of Claims 1, and 3-5, further comprising adjusting the pressure on the biomass to attain a desired EPA level in the biomass.

7. The method as claimed in any one of Claims 1, 2, and 4-6, further comprising adjusting the temperature in the broth to attain a desired EPA level in the biomass.

8. A method of increasing the concentration of EPA in a biomass of a microorganism having fatty acids and a concentration of EPA, comprising:

(a) fermenting the microorganism in a fermentor vessel, comprising a gas, to produce a biomass wherein the microorganism comprises a Thraustochytrid that produces a biomass having at least 3% EPA of the total weight of the fatty acids ; and

(b) supplementing the gas with CO_2 sufficient to increase the concentration of the EPA in the biomass.

9. The method as recited in Claim 8 wherein the amount of CO_2 is greater than or equal to 2% (mole) of the gas in the chamber and the concentration of the EPA in the biomass is increased to greater than about 4%, by weight, of the total weight of the fatty acids.

10. The method as recited in Claim 9 wherein the amount of CO_2 is greater than or equal to about 5% up to about 20% (mole) of the gas in the chamber.

11. The method as recited in Claim 10 wherein the amount of CO_2 is greater than or equal to about 5% up to about 15% (mole) of the gas in the vessel.

12. The method as recited in Claim 9 wherein the concentration of EPA is increased from greater than about 4% up to about 45%, by weight, of the total weight of the fatty acids.

13. The method as recited in Claim 11 wherein the concentration of EPA is increased from greater than about 4% up to about 40%, by weight, of the total weight of the fatty acids.

14. The method as recited in Claim 12 wherein the concentration of the EPA is increased from about 4%, by weight of the total weight of the fatty acids to a range of about 6% to about 30%, by weight of the total weight of the fatty acids.

15. The method as recited in Claim 9 wherein the concentration of EPA is increased from about 15%, by weight, of the total fatty acids up to about 40% by weight of the total fatty acids.

16. The method as recited in Claim 9 wherein the concentration of the EPA is increased to greater than 20%, by weight, of the total weight of the fatty acids.

17. The method as recited in Claim 9 wherein the concentration of the EPA is increased from about 20%, up to about 25%, by weight, of the total weight of the fatty acids.

18. A method of increasing the concentration of EPA in a biomass of a microorganism having fatty acids and a concentration of EPA, comprising:

(a) fermenting the microorganism in a fermentor vessel to produce a biomass; and

(b) providing a pressure on the biomass of greater than or equal to 0.5 psi above atmospheric pressure for a time sufficient to increase the concentration of EPA in the biomass.

19. The method as recited in Claim 18 wherein the vessel has a head pressure of from about 0.4 psi up to about 30 psi.

20. The method as recited in Claim 19 wherein the vessel has a head pressure of from about 1 up to about 30 psi.

21. The method as recited in Claim 20 wherein the vessel has a head pressure of from about 1 up to about 20 psi.

22. The method as recited in Claim 18 wherein the pressure is a provided up to about 120 hours.

23. The method as recited in Claim 2 wherein the biomass has a density of great than or equal to 10 g/l.

24. The method as recited in Claim 23 wherein the biomass has a density of about 10 g/l up to about 250 g/l.

25. The method as recited in Claim 3 wherein the temperature is adjusted to less than about 30 °C.

26. The method as recited in Claim 25 wherein the temperature is less than about 22 °C.

27. The method as recited in Claim 26 wherein the temperature is at about 21°C.

28. A biomass made according to anyone of Claims 1 to 27.

29. An oil extracted from a biomass of Claim 28 wherein the biomass is produced from an isolated microorganism deposited under ATCC Accession No. PTA-10208 wherein the oil comprises comprising fatty acids wherein the fatty acids further comprise omega-3 polyunsaturated fatty acids wherein the omega-3 polyunsaturated fatty acids comprise DHA and EPA in an amount of about ≥90%, by weight, of the total amount of omega-3 polyunsaturated fatty acids and the amount of EPA, by weight, is from about 6% up to about 65% of the total amount of EPA and DHA.

30. The oil as recited in Claim 29 wherein the amount of EPA, by weight, is from about 6% up to about 28% of the total amount of EPA and DHA.

31. The oil as recited in Claim 29 wherein the amount of EPA, by weight, is from about 36% up to about 65 of the total amount of the EPA and DHA.

32. The oil as recited in Claim 29 where the amount of EPA, by weight, is from about 28% to about 36% of the total amount of EPA and DHA.

33. An oil extracted from a biomass of Claim 28 wherein the biomass is produced from an isolated microorganism deposited under ATCC Accession No. PTA-10212 wherein the oil comprises fatty acids wherein the fatty acids further comprise DHA and EPA and the amount of EPA, by weight, is from about 15 up to about 70 % of the total weight of EPA and DHA.

34. An oil extracted from a biomass of Claim 28 wherein the biomass is produced from an isolated microorganism deposited deposited under ATCC Accession No. PTA-9695 whereiin the oil comprises fatty acids wherein the fatty acids further comprises omega-3 polyunsaturated fatty acids wherein the omega-3 polyunsaturated fatty acids comprise DHA and EPA in an amount of about 50 to about 70% by weight, of the total amount of omega-3 polyunsaturated fatty acids and the amount of EPA, by weight, is from about 5% up to about 60% of the total amount of the total weight of the EPA and DHA.

35. The oil as recited in Claim 34 wherein the DHA and EPA is in an amount of about 60% of the total amount of the omega-3 fatty acids.

36. A method of making a biomass of a microorganism having fatty acids and a concentration of EPA, comprising:

(a) fermenting the microorganism in a fermentor vessel, comprising a gas, to produce a biomass wherein the microorganism comprises a Thraustochytrid that produces a biomass having at least 3% EPA of the total weight of the fatty acids wherein the microorganism comprises a Thraustochytrid that produces a biomass having at least 3% EPA of the total weight of the fatty acids; and

(b) supplementing the gas with CO_2.

37. The method as recited in Claim 2 wherein the amount of the biomass, EPA or DHA is measured prior to adjusting the pressure on the biomass.

38. The method as recited in Claim 3 wherein the amount of the biomass, EPA or DHA is measured prior to adjusting the temperature in the broth.

39. The method as recited Claim 4 wherein the amount of the biomass, EPA or DHA is measured prior to adjusting the CO_2 in the vessel.

40. The method as recited Claim 5 wherein the amount of the biomass, EPA or DHA is measured prior to adjusting the dissolved CO_2.

41. A method of producing an oil, the method comprising making a biomass according to any one of claims 1-27 and 36-40, and obtaining the oil from the biomass.

42. The method of claim 41, wherein the oil is extracted from the biomass.

43. A method of making a biomass of a microorganism having increased concentration of EPA, comprising growing the microorganism in a culture medium comprising less than 0.1 mg/L vitamin B12 to produce a biomass.

44. The method of claim 43, wherein the culture medium comprises less than 0.01 mg/L vitamin B12.

45. The method of claim 44, wherein the culture medium comprises less than 0.001 mg/L vitamin B12.

46. The method of claim 45, wherein the culture medium comprises less than 0.0001 mg/L vitamin B12.

47. The method of claim 46, wherein the culture medium contains no vitamin B12.

48. The method of any one of claims 43 to 47, wherein the culture medium further comprises less than 1 g of yeast extract per 50 g of lipid-free biomass.

49. The method of any one of claims 43 to 48, wherein the culture medium further comprises less than 0.5 g of yeast extract per 50 g of lipid-free biomass.

50. The method of any one of claims 43 to 49, wherein the culture medium further comprises less than 0.1 g of yeast extract per 50 g of lipid-free biomass.

51. The method of any one of claims 43 to 50, wherein the EPA concentration is increased by at least 400% compared to the EPA concentration in a biomass obtained from the microorganism grown in a culture medium comprising greater than 0.1 mg/L vitamin B12.

52. The method of any one of claim 44 to 50, wherein the EPA concentration is increased by at least 300% compared to the EPA concentration in a biomass from a microorganism grown in a culture medium comprising greater than 0.01 mg/L vitamin B12.

53. The method of any one of claim 45 to 50, wherein the EPA concentration is increased by at least 200% compared to the EPA concentration in a biomass from a microorganism grown in a culture medium comprising greater than 0.001 mg/L vitamin B12.

54. The method of any one of claim 46 to 50, wherein the EPA concentration is increased by at least 100% compared to the EPA concentration in a biomass from a microorganism grown in a culture medium comprising greater than 0.0001 mg/L vitamin B12.

55. A method of making a biomass of a microorganism having increased concentration of EPA, comprising growing the microorganism in a culture medium comprising less than 0.1 mg/L cobalt to produce a biomass.

56. The method of claim 55, wherein the culture medium comprises less than 0.01 mg/L cobalt.

57. The method of claim 56, wherein the culture medium comprises less than 0.001 mg/L cobalt.

58. The method of claim 57, wherein the culture medium comprises less than 0.0001 mg/L cobalt.

59. The method of claim 58, wherein the culture medium contains no cobalt.

60. The method of any one of claims 43 to 59, wherein the microorganism is a Thraustochytrid.

61. The method of any one of claims 43 to 60, wherein the microorganism produces at least 3% EPA of the total weight of the fatty acids.

62. The method of any one of claims 43 to 61, wherein the culture medium has a dissolved CO_2 level of at least 5%.

63. The method of any one of claims 43 to 62, wherein the culture medium has a dissolved CO_2 level of at least 10%.

64. The method of any one of claims 43 to 63, wherein the culture medium has a dissolved CO_2 level of at least 15%.

65. An isolated biomass of any one of claims 43 to 64.

66. A microbial oil extracted from the biomass of any one of claims 43 to 65.

WHAT IS CLAIMED:

1. A method of making a biomass of a microorganism having fatty acids and a concentration of EPA, comprising:

(a) fermenting the microorganism in a fermentor vessel to produce a fermentation broth having an aqueous phase and biomass wherein the aqueous phase has a dissolved gas wherein the microorganism comprises a Thraustochytrid that produces a biomass having at least 3% EPA of the total weight of the fatty acids; and

(b) attaining a desired EPA level in the biomass by

(i) adjusting the dissolved CO_2 to >2% of the dissolved gas,

(ii) optionally adjusting the pressure on the biomass, and

(iii) optionally adjusting the temperature in the broth.

2. A method of increasing the concentration of EPA in a biomass of a microorganism having fatty acids and a concentration of EPA, comprising:

(a) fermenting the microorganism in a fermentor vessel to produce biomass; and

(b) providing a pressure on the biomass of greater than or equal to 0.5 psi above atmospheric pressure for a time sufficient to increase the concentration of EPA in the biomass.

3. A biomass made according to claim 1 or claim 2.