CLAIMS

What is claimed is:

1. A method for producing a biomass, the method comprising:

providing a gas mixture to a consortium of bacteria and microbes in a bioreactor, the consortium consisting of, or consisting essentially of, at most six species and at least three species of *Cupriavidus necator*, *Rhodobacter sphaeroides*, *Rhodopseudomonas palustris*, *Rhodobacter capsulatus*, *Bacillus subtilis*, and *Bacillus megaterium*, the gas mixture including each of hydrogen gas, carbon dioxide gas, and oxygen gas, whereby hydrogen is metabolized by at least some of the bacteria of the consortium and growth of the consortium occurs solely by the fixation of carbon dioxide;

harvesting cells of the bacteria and microbes from the bioreactor; and

drying the solids to yield the biomass.

2. The method of claim 1, further comprising

separately receiving hydrogen gas and flue gas, the flue gas including both the carbon dioxide gas and the oxygen gas, and

mixing the hydrogen gas and flue gas to produce the gas mixture.

3. The method of claim 2, wherein, mixing the hydrogen gas and flue gas comprises diluting the flue gas approximately 5-fold with the hydrogen gas.

4. The method of claim 1, 2 or 3, wherein one of the hydrogen gas, carbon dioxide gas, and oxygen gas is introduced separately into the bioreactor from the other two gases.

5. The method of any of the preceding claims, wherein the consortium of bacteria consists solely of *Cupriavidus necator*, *Rhodobacter sphaeroides*, *Rhodopseudomonas palustris*, *Rhodobacter capsulatus*, and *Bacillus subtilis*.

6. The method of any of the preceding claims, wherein at least one of the bacterium of the consortium is of a strain that has been adapted over multiple generations to be tolerant of a flue gas, and wherein the gas mixture includes the flue gas.

7. The method of any of the preceding claims, further comprising, before providing the gas mixture to the consortium, adapting a bacterium of the consortium to a flue gas by growing multiple successive generations of the bacterium in the presence of the flue gas to produce an adapted bacterium, wherein the gas mixture includes the flue gas.

8. The method of any of the preceding claims, wherein one of the bacterium of the consortium expresses a carotenoid.

9. A product made by the method of any of the preceding claims.

10. A method for producing a feed product comprising: producing a biomass by providing a gas mixture to a consortium of bacteria and microbes in a bioreactor, the consortium consisting of, or consisting essentially of, at most six species and at least three species of *Cupriavidus necator*, *Rhodobacter sphaeroides*, *Rhodopseudomonas palustris*, *Rhodobacter capsulatus*, *Bacillus subtilis*, and *Bacillus megaterium*, the gas mixture including each of hydrogen gas, carbon dioxide gas, and oxygen gas, whereby hydrogen is metabolized by at least some of the bacteria of the consortium and growth of the consortium occurs solely by the fixation of carbon dioxide,

harvesting cells of the bacteria and microbes from the bioreactor,

dewatering, concentrating or drying the solids to yield the biomass; and

blending the biomass with an additive.

11. A food or feed additive comprising:

a consortium consisting of, or consisting essentially of, at most six species including:

Cupriavidus necator,

a species from the genus *Rhodobacter,*

a species from the genus *Rhodopseudomonas,* and

a species from the genus *Bacillus.*

12. The food or feed additive of claim 11,

wherein the species from the genus *Rhodobacter* comprises *Rhodobacter sphaeroides*, and/or

wherein the species from the genus *Rhodopseudomonas* comprises *Rhodopseudomonas palustris*.

13. The food or feed additive of claim 11 or 12, wherein the species from the genus *Bacillus* comprises *bacillus subtilis*.

14. The food or feed additive of claim 12 or 13, further comprising *Rhodobacter capsulatus*.

15. The food or feed additive of any of the preceding claims 11 to 14, wherein the consortium is characterized by an enhanced attractiveness to fish and/or an enhanced palatability to fish in comparison to fishmeal.

16. The food or feed additive of any of the preceding claims 11 to 15, wherein the *C. necator* comprises over 85% of a dry weight of the consortium of the food or feed additive.