What is claimed is:

1. A method for aerobic, heterotrophic cultivation of a high density culture of a *Chlamydomonas* species comprising:

maintaining a production culture of the *Chlamydomonas* sp. aerobically at a pH set point between 6.0 and 7.0;

initiating feeding of the production culture by providing acetic acid or acetate as a sole carbon source only when the pH of the production culture exceeds by 0.5 above the set point and discontinuing the feeding with the carbon source when the pH decreases by 0.2 below the set point.

2. The method of claim 1, wherein said *Chlamydomonas* sp. does not contain a heterologous gene.

3. The method of claim 1, wherein said *Chlamydomonas* sp. contains a heterologous gene.

4. The method of claim 1, wherein the production culture is maintained in the absence of light.

5. The method of claim 1, wherein the pH set point is selected from the group consisting of 6.0, 6.2, 6.5, 6.8 and 7.0.

6. The method of claim 1, comprising growing the production culture until it reaches a target density, wherein the target density is between 50 and 75g/L, between 75 and 100g/L, between 100 and 125g/L, between 125 and 150g/L, between 150 and 175g/L or between 175 and 200g/L dry cell weight.

7. The method of claim 6, wherein the target density is between 75 and 100g/L.

8. The method of claim 6 or 7, wherein the target density is reached within 250 hours after inoculation of the production culture.

9. The method of claim 3, wherein the heterologous gene encodes a therapeutic protein and wherein the method further comprises harvesting the therapeutic protein from the production culture.

10. (The method of any one of claims 1-9, further comprising harvesting the *Chlamydomonas* sp. from the production culture.

11. The method of claim 10, further comprising preparing a nutritional supplement or nutritional additive from the *Chlamydomonas* sp. harvested from the production culture.

12. The method of claim 9 or 10, further comprising drying the *Chlamydomonas* sp. to a moisture content of less than 25%, less than 20%, less than 15%, less than 10% or less than 5% moisture.

13. The method of any one of claims 1-12, wherein the *Chlamydomonas* sp. is selected from the group consisting of *Chlamydomonas reinhardtii, Chlamydomonas dysomos, Chlamydomonas mundane, Chlamydomonas debaryana, Chlamydomonas moewussi, Chlamydomonas culleus, Chlamydomonas noctigama, Chlamydomonas aulata, Chlamydomonas applanata, Chlamydomonas marvanii, Chlamydomonas proboscigera*, and any combination thereof.

14. The method of claim 13, wherein the *Chlamydomonas* sp. is *Chlamydomonas reinhardtii*.

15. The method of claim 10 or 11, wherein said harvesting is by filtration or centrifugation.

16. The method of any one of claims 1-15, wherein the pH set point of the production culture is 6.5.