What is claimed is

1. A method of reducing the ammonium ion concentration in a mammalian cell culture, comprising steps of:

a. growing the cells in a cell culture medium, and

b. contacting or administering an effective amount of a tricarboxylic acid ("TCA") intermediate composition to the cell culture medium, wherein the TCA intermediate composition comprises about 0.1 mM to about 100 mM oxaloacetic acid.

2. A method of maintaining or increasing cell productivity in a mammalian cell culture, wherein the ammonium ion generation is reduced, comprising steps of:

a. growing the cells in a cell culture medium, and

b. contacting or administering an effective amount of a TCA intermediate composition to the cell medium, wherein the TCA intermediate composition comprises about 0.1 mM to about 100 mM oxaloacetic acid.

3. A method of maintaining or increasing cell growth in a mammalian cell culture, wherein ammonium ion generation is reduced, comprising steps of:

a. growing the cells in a cell culture medium, and

b. contacting or administering an effective amount of a TCA intermediate composition to the cell culture medium, wherein the TCA intermediate composition comprises about 0.1 mM to about 100 mM oxaloacetic acid.

4. A method of reducing the influence of ammonium ion accumulation on antibody glycosylation patterns in a cell culture, wherein ammonium ion generation is reduced, comprising steps of:

a. growing the cells in a cell culture medium, and

b. contacting or administering an effective amount of a TCA intermediate composition to the cell culture medium, wherein the TCA intermediate composition comprises about 0.1 mM to about 100 mM oxaloacetic acid.

5. A method according to any of Claims 1-4, in which cell-specific productivity is also maintained.

6. A method according to any one of Claims 1-5, wherein the TCA intermediate composition comprises about 3 mM to about 45 mM oxaloacetic acid.

7. A cell culture medium comprising about 0.1 mM to about 100mM oxaloacetic acid.

8. A cell culture medium according to claim 7, in which cell-specific productivity is also maintained.

9. A cell culture medium according to claim 7 or 8, wherein the medium comprises about 3 mM to about 45 mM oxaloacetic acid.

10. A method of reducing the ammonium ion concentration in a mammalian cell culture, comprising steps of:

a. growing the cells in a cell culture medium, and

b. contacting or administering an effective amount of a tricarboxylic acid ("TCA) intermediate composition to the cell culture medium, wherein the TCA intermediate composition comprises about 0.1 mM to about 100 mM malic acid and about 0.1 mM to about 100 mM pyruvic acid.

11. A method of maintaining or increasing cell productivity in a mammalian cell culture, wherein the ammonium ion generation is reduced, comprising steps of:

a. growing the cells in a cell culture medium, and

b. contacting or administering an effective amount of a TCA intermediate composition to the cell medium, wherein the TCA intermediate composition comprises about 0.1 mM to about 100 mM malic acid and about 0.1 mM to about 100 mM pyruvic acid.

12. A method of maintaining or increasing cell growth in a mammalian cell culture, wherein ammonium ion generation is reduced, comprising steps of:

a. growing the cells in a cell culture medium, and

b. contacting or administering an effective amount of a TCA intermediate composition to the cell culture medium, wherein the TCA intermediate composition comprises about 0.1 mM to about 100 mM malic acid and about 0.1 mM to about 100 mM pyruvic acid.

13. A method of reducing the influence of ammonium ion accumulation on antibody glycosylation patterns in a cell culture, wherein ammonium ion generation is reduced, comprising steps of:

a. growing the cells in a cell culture medium, and

b. contacting or administering an effective amount of a TCA intermediate composition to the cell culture medium, wherein the TCA intermediate composition comprises about 0.1 mM to about 100 mM malic acid and about 0.1 mM to about 100 mM pyruvic acid.

14. A method according to any of Claims 10-13, in which cell-specific productivity is also maintained.

15. A method according to any one of Claims 10-14, wherein the TCA intermediate composition comprises about 3 mM to about 45 mM malic acid and about 3 mM to about 45 mM pyruvic acid.

16. A cell culture medium comprising about 0.1 mM to about 100 mM malic acid and about 0.1 mM to about 100 mM pyruvic acid.

17. A cell culture medium according to claim 16, in which cell-specific productivity is also maintained.

18. A cell culture medium according to claim 16 or 17, wherein the medium comprises about 3 mM to about 45 mM malic acid and about 3 mM to about 45 mM pyruvic acid.

19. A method of reducing the ammonium ion concentration in a mammalian cell culture, comprising steps of:

a. growing the cells in a cell culture medium, and

b. contacting or administering an effective amount of a tricarboxylic acid ("TCA) intermediate composition to the cell culture medium, wherein the TCA intermediate composition comprises about 0.1 mM to about 100 mM α-ketoglutarate.

20. A method of reducing the influence of ammonium ion accumulation on antibody glycosylation patterns in a cell culture, wherein ammonium ion generation is reduced, comprising steps of:

a. growing the cells in a cell culture medium, and

b. contacting or administering an effective amount of a TCA intermediate composition to the cell culture medium, wherein the TCA intermediate composition comprises about 0.1 mM to about 100 mM α-ketoglutarate.

21. A method according to any one of claims 19 or 20, wherein the TCA intermediate composition comprises about 3 mM to about 45 mM α-ketoglutarate.

22. A cell culture medium comprising about 0.1 mM to about 100mM α-ketoglutarate.

23. A cell culture medium according to claim 22, wherein the medium comprises about 3 mM to about 45 mM α-ketoglutarate.

What is claimed is

1. A method of reducing the ammonium ion concentration in a mammalian cell culture, comprising steps of:

a. growing the cells in a cell culture medium, and

b. contacting or administering an effective amount of a tricarboxylic acid ("TCA) intermediate composition to the cell culture medium, wherein the TCA intermediate composition comprises about 0.1 mM to about 100 mM malic acid and about 0.1 mM to about 100 mM pyruvic acid.

2. A method of maintaining or increasing cell productivity in a mammalian cell culture, wherein the ammonium ion generation is reduced, comprising steps of:

a. growing the cells in a cell culture medium, and

b. contacting or administering an effective amount of a TCA intermediate composition to the cell medium, wherein the TCA intermediate composition comprises about 0.1 mM to about 100 mM malic acid and about 0.1 mM to about 100 mM pyruvic acid.

3. A method of maintaining or increasing cell growth in a mammalian cell culture, wherein ammonium ion generation is reduced, comprising steps of:

a. growing the cells in a cell culture medium, and

b. contacting or administering an effective amount of a TCA intermediate composition to the cell culture medium, wherein the TCA intermediate composition comprises about 0.1 mM to about 100 mM malic acid and about 0.1 mM to about 100 mM pyruvic acid.

4. A method of reducing the influence of ammonium ion accumulation on antibody glycosylation patterns in a cell culture, wherein ammonium ion generation is reduced, comprising steps of:

a. growing the cells in a cell culture medium, and

b. contacting or administering an effective amount of a TCA intermediate composition to the cell culture medium, wherein the TCA intermediate composition comprises about 0.1 mM to about 100 mM malic acid and about 0.1 mM to about 100 mM pyruvic acid.

5. A method according to any of Claims 1-4, in which cell-specific productivity is also maintained.

6. A method according to any one of Claims 1-5, wherein the TCA intermediate composition comprises about 3 mM to about 45 mM malic acid and about 3 mM to about 45 mM pyruvic acid.

7. A cell culture medium comprising about 0.1 mM to about 100 mM malic acid and about 0.1 mM to about 100 mM pyruvic acid.

8. A cell culture medium according to claim 7, in which cell-specific productivity is also maintained.

9. A cell culture medium according to claim 7 or 8, wherein the medium comprises about 3 mM to about 45 mM malic acid and about 3 mM to about 45 mM pyruvic acid.

10. A method of reducing the ammonium ion concentration in a mammalian cell culture, comprising steps of:

a. growing the cells in a cell culture medium, and

b. contacting or administering an effective amount of a tricarboxylic acid ("TCA) intermediate composition to the cell culture medium, wherein the TCA intermediate composition comprises about 0.1 mM to about 100 mM α-ketoglutarate.

11. A cell culture medium comprising about 0.1 mM to about 100mM α-ketoglutarate.

12. A method of reducing the ammonium ion concentration in a mammalian cell culture, comprising steps of:

a. growing the cells in a cell culture medium, and

b. contacting or administering an effective amount of a tricarboxylic acid ("TCA") intermediate composition to the cell culture medium, wherein the TCA intermediate composition comprises about 0.1 mM to about 100 mM oxaloacetic acid.

13. A method of maintaining or increasing cell productivity or cell growth in a mammalian cell culture, wherein the ammonium ion generation is reduced, comprising steps of:

a. growing the cells in a cell culture medium, and

b. contacting or administering an effective amount of a TCA intermediate composition to the cell medium, wherein the TCA intermediate composition comprises about 0.1 mM to about 100 mM oxaloacetic acid.

14. A method of reducing the influence of ammonium ion accumulation on antibody glycosylation patterns in a cell culture, wherein ammonium ion generation is reduced, comprising steps of:

a. growing the cells in a cell culture medium, and

b. contacting or administering an effective amount of a TCA intermediate composition to the cell culture medium, wherein the TCA intermediate composition comprises about 0.1 mM to about 100 mM oxaloacetic acid.

15. A cell culture medium comprising about 0.1 mM to about 100mM oxaloacetic acid.