

CLAIMS

What is claimed is:

1. A method for reducing the incidence of obesity and/or metabolic syndrome in a target subject, the method comprising the step of administering a nutritional composition comprising: a carbohydrate source; a protein or protein equivalent source; a fat or lipid source; and
 - a) dietary butyrate; and/or
 - b) lactoferrin;
2. The method of claim 1, wherein the nutritional composition further comprises a probiotic.
3. The method of claim 1 or claim 2, wherein 1% to 99% of the protein equivalent source includes a peptide component comprising SEQ ID NO 4, SEQ ID NO 13, SEQ ID NO 17, SEQ ID NO 21, SEQ ID NO 24, SEQ ID NO 30, SEQ ID NO 31, SEQ ID NO 32, SEQ ID NO 51, SEQ ID NO 57, SEQ ID NO 60, and SEQ ID NO 63; and 1% to 99% of the protein equivalent source comprises a partially hydrolyzed protein, an extensively hydrolyzed protein, or combinations thereof.
4. The method of any of the previous claims, wherein the nutritional composition further comprises inositol.
5. The method of any of the previous claims, wherein the nutritional composition further comprises a prebiotic.
6. The method of any of the previous claims, wherein the dietary butyrate is present in an amount of from about 0.5 mg/100 Kcal to about 300 mg/100 Kcal.
7. The method of any of the previous claims, wherein the dietary butyrate comprises sodium butyrate.
8. The method of any of the previous claims, wherein the nutritional composition comprises dietary butyrate that is provided by an enriched lipid fraction derived from bovine milk.

9. The method of claim 8, wherein the enriched lipid fraction derived from milk further comprises milk fat globule membrane.

10. The method of any of the previous claims, wherein the nutritional composition further comprises one or more long chain polyunsaturated fatty acids.

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11. The method of claim 10, wherein the one or more long chain polyunsaturated fatty acids comprises docosahexaenoic acid, arachidonic acid, and combinations thereof.

12. The method of any of the previous claims, wherein the nutritional composition further comprises β -glucan.

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13. The method of any of the previous claims, wherein the nutritional composition further comprises a culture supernatant from a late-exponential growth phase of a probiotic batch-cultivation process.

14. The method of any of the previous claims, wherein the nutritional composition is an infant formula.

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15. A method for maintaining healthy weight and/or metabolism in a target subject, the method comprising the step of administering a nutritional composition, comprising per 100 Kcal:

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- (i) between about 6 g and about 22 g of a carbohydrate source;
- (ii) between about 1 g and about 7 g of a protein source;
- (iii) between about 1 g and about 10.3 g of a fat source; and
- (iv) between about 0.5 mg and 300 mg of dietary butyrate or 15 mg and 300

25 mg of lactoferrin

16. The method of claim 15, wherein the nutritional composition further comprises β -glucan.

17. The method of claim 15 or claim 16, wherein the nutritional composition further comprises one or more long chain polyunsaturated fatty acids.

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18. The method of any one of claims 15 to 17, wherein the nutritional composition further comprises one or more prebiotics.

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19. A method of improving adipose tissue functioning in a formula-fed infant, the method comprising the step of administering to the formula fed infant a nutritional composition comprising a carbohydrate source; a protein or protein equivalent source; a fat or lipid source; and dietary butyrate or lactoferrin.

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20. The method of claim 19, wherein the nutritional composition comprises *Lactobacillus rhamnosus* GG.

21. The method of claim 19 or claim 20, wherein the nutritional composition is an infant
10 formula.

22. A staged feeding regimen for an infant or child, comprising the steps of:

A) administering a first nutritional composition comprising from about 4 µg/mL to about 36 µg/mL of dietary butyrate, OR from about x µg/mL to about x µg/mL of lactoferrin to the infant from birth to about 3 months of age;

15 B) administering a second nutritional composition comprising from about 6 µg/mL to about 33 µg/mL of butyrate OR from about x µg/mL to about x µg/mL of lactoferrin to the infant from 3 months of age to about 6 months of age; and

C) administering a third nutritional composition comprising from about 8 µg/mL to about 40 µg/mL of butyrate OR from about x µg/mL to about x µg/mL of lactoferrin to
20 the infant from 6 months of age to about 12 months of age,

wherein each of the first nutritional composition, the second nutritional composition and the third nutritional composition are different from each other.

23. The staged feeding regimen according to claim 22, wherein the first nutritional
25 composition comprises from about 7 µg/mL to about 22 µg/mL of dietary butyrate; the second nutritional composition comprises from about 17 µg/mL to about 24 µg/mL of butyrate; and the third nutritional composition comprises from about 17 µg/mL to about 22 µg/mL of butyrate, OR

wherein the first nutritional composition comprises from about X µg/mL to about XXµg/mL
30 of lactoferrin; the second nutritional composition comprises from about XX µg/mL to about XX µg/mL of lactoferrin; and the third nutritional composition comprises from about XX µg/mL to about XXµg/mL of lactoferrin.

24. The staged feeding regimen of claim 22 or claim 23, wherein the first nutritional
35 composition further comprises at least one of the following selected from the group

consisting of: i) up to about 0.2 mg/100 kcal of iron; ii) up to about 0.7 mg/100 kcal of zinc; iii) up to about 2 g/100 kcal of protein; iv) a protein source comprising a whey:casein ratio of at least about 72:28; v) up to 35 mg/100 kcal of inositol; and vii) from about 1.8 µg/100 kcal to about 2.0 µg/100 kcal of vitamin D.

- 5 25. The staged feeding regimen of any one of claims 22 - 24, wherein the second nutritional composition further comprises at least one of the following selected from the group consisting of: i) from about 0.3 mg/100 kcal to about 0.6 mg/100 kcal of iron; ii) up to about 0.9 mg/100 kcal of zinc; iii) up to about 1.9 g/100 kcal of protein; iv) a protein source comprising a whey:casein ratio of about 65:44 to about 68:32; v) up to 25 mg/100
10 kcal of inositol; vi) up to 9.0 mg/100 kcal of butyrate; and vii) from about 1.8 µg/100 kcal to about 2.0 µg/100 kcal of vitamin D.

- 15 26. The staged feeding regimen of any one of claims 22 -25, wherein the third nutritional composition further comprises at least one of the following selected from the group consisting of: i) from about 0.3 mg/100 kcal to about 1.2 mg/100 kcal of iron; ii) up to about 1 mg/100 kcal of zinc; iii) up to about 1.5 g/100 kcal of protein; iv) a protein source comprising a whey:casein ratio of about 45:55 to about 56:44; v) up to 20 mg/100 kcal of inositol; vi) up to 9.0 mg/100 kcal of butyrate; and vii) from about 1.8 µg/100 kcal to about 2.0 µg/100 kcal of vitamin D.

- 20 27. The staged feeding regimen of any one of claims 22 - 26, wherein the first nutritional composition, second nutritional composition, and third nutritional composition each further comprise docosahexaenoic acid.

- 25 28. The staged feeding regimen of any one of claims 22 - 27, wherein the first nutritional composition, second nutritional composition, and third nutritional composition each further comprise a carbohydrate source, a fat source, and a protein source.

- 30 29. The staged feeding regimen of any one of claims 22 - 28, wherein the first nutritional composition, second nutritional composition, and third nutritional composition each further comprise prebiotics.

- 35 30. The staged feeding regimen of any one of claims 22 -29, wherein the first nutritional composition, second nutritional composition, and third nutritional composition each further comprise
Lactobacillus rhamnosus GG.

31. The staged feeding regimen of any one of claims 22 -30, wherein the first nutritional composition, second nutritional composition, and third nutritional composition each further comprise β -glucan.