18. The composition according to any one of claims 1, 4, 7, 10, 13 and 16, wherein the biguanide or related heterocyclic compound comprises one or more double bonds, wherein the compound is a cis/trans, E/Z mixture or an E or Z geometric isomer thereof.

19. The composition according to any one of claims 1, 4, 7, 10, 13 and 16, wherein the biguanide or related heterocyclic compound is a salt selected from hydrochloride, hydrobromide, acetate, propionate, butyrate, sulfate, hydrogen sulfate, sulfite, carbonate, hydrogen carbonate, phosphate, phosphinate, oxalate, hemi-oxalate, malonate, hemi-malonate, fumarate, hemi-fumarate, maleate, hemi-maleate, citrate, hemi-citrate, tartrate, hemi-tartrate, aspartate and glutamate.

20. The composition according to any one of claims 1, 4, 7, 10, 13 and 16, wherein the biguanide or related heterocyclic compound is formulated as a composition comprising the components A, B, and C, wherein:

A is the protonated form of a natural or unnatural amino acid;

B is the dianion of an acid; and

C is the protonated form of any the biguanide or related heterocyclic compound.

21. The composition according to claim 20, wherein

A is the protonated form of a natural amino acid selected from alanine, aspartic acid, asparagine, arginine, glycine, glutamine, glutamic acid lysine, phenylalanine, tyrosine, serine, threonine, tryptophan, leucine, isoleucine, histidine, methionine, proline, cysteine, and cystine; and

B is the dianion of an acid selected from oxalic, malonic, citric, maleic, fiunaric, tartaric, aspartic, and glutamic acid.

C is the protonated form of the biguanide or related heterocyclic compound.

22. The composition according to any one of claims 1, 4, 7, 10, 13 and 16, further comprising a DPP-IV inhibitor.

23. The composition according to any one of claims 1, 4, 7, 10, 13 and 16, further comprising an anti-obesity or anti-diabetes agent.

24. A composition according to any one of claims 1, 4, 7, 10, 13 and 16, the composition further comprising a chemosensory receptor ligand that is selected from the group consisting of a sweet receptor ligand, an umami receptor ligand, a fat receptor ligand, a sour receptor ligand and a bile acid receptor ligand.

25. A method of inducing feelings of happiness, well-being or contentment in subjects comprising administering at a composition according to any one of claims 1, 4, 7, 10, 13 and 16.

26. A method of treating a condition selected from metabolic syndrome, diabetes type I, diabetes type II, obesity, binge eating, undesired food cravings, food addiction, a desire to reduce food intake or to lose weight or maintain weight loss, desire to maintain healthy weight, desire to maintain normal blood glucose metabolism, anorexia, pre-diabetes, glucose intolerance, gestational diabetes mellitus (GDM), impaired fasting glycemia (IFG), post-prandial hyperglycemia, accelerated gastric emptying, dumping syndrome, delayed gastric emptying, dyslipidemia, post-prandial dyslipidemia, hyperlipidemia, hypertriglyceridemia, post-prandial hypertriglyceridemia, insulin resistance, bone loss disorders, osteopenia, osteoporosis, muscle wasting disease, muscle degenerative disorders, polycystic ovary syndrome (PCOS), nonalcoholic fatty liver disease (NAFL), non-alcoholic steatohepatitis (NASH), immune disorders of the gut, celiac disease, bowel irregularity, irritable bowel syndrome (IBS), inflammatory bowel disease (IBD), ulcerative colitis, Crohn's disease, short bowel syndrome, peripheral neuropathy and diabetic neuropathy in a subject comprising administering at a composition according to any one of claims 1, 4, 7, 10, 13 and 16.

27. A method of treating a condition selected from sadness, stress, grief, anxiety, anxiety disorder (e.g., generalized anxiety disorder, obsessive-compulsive disorder, panic disorder, post-traumatic stress disorder or social anxiety disorder or a mood disorder (e.g., depression, bipolar disorder, dysthymic disorder and cyclothymic disorder) comprising administering at a composition according to any one of claims 1, 4, 7, 10, 13 and 16.

28. A method according to claim 26, wherein the condition is diabetes.

29. A method according to claim 26, wherein the condition is obesity.

30. A method according to claim 26, wherein the subject has undergone bariatric surgery.

31. A method according to claim 6 further comprising administration of a drug for diabetes or obesity.

32. A method of treating a defect in energy homeostasis in a subject comprising administering at a composition according to any one of claims 1, 4, 7, 10, 13 and 16.

33. A method of treating overweight in a subject by administering a composition according to any one of claims 1, 4, 7, 10, 13 and 16 to the subject.

34. A method of treating obesity in a subject by administering a composition according to any one of claims 1, 4, 7, 10, 13 and 16 to the subject.

35. A method of reducing food intake in a subject by administering a composition according to any one of claims 1, 4, 7, 10, 13 and 16 to the subject.

36. A method of treating type II diabetes in a subject by administering a composition according to any one of claims 1, 4, 7, 10, 13 and 16 to the subject.

37. A method of maintaining healthy body weight in a subject by administering a composition according to any one of claims 1, 4, 7, 10, 13 and 16 to the subject.

38. A method of treating pre-diabetes in a subject by administering a composition according to any one of claims 1, 4, 7, 10, 13 and 16 to the subject.

39. A method of increasing circulating GLP-1 concentration in a subject by administering a composition according to any one of claims 1, 4, 7, 10, 13 and 16 to the subject.

40. A method of increasing circulating PYY concentration in a subject by administering a composition according to any one of claims 1, 4, 7, 10, 13 and 16 to the subject.

41. A pharmaceutical dosage form comprising:

(a) a pH 6.5 enterically coated immediate release component comprising metformin hydrochloride and a pharmaceutically acceptable excipient; and b) a pH 6.5 enterically coated extended release component comprising metformin hydrochloride and a pharmaceutically acceptable excipient; and

wherein the combined amount of metformin from both components is less than 400 mg and wherein the metformin has sub-therapeutic plasma AUC and sub-therapeutic plasma Cmax.

42. A pharmaceutical dosage form according to claim 41, wherein the proportion of metformin hydrochloride in the immediate release component to the metformin hydrochloride in the extended release component is about 20/80, 30/70, 35/65, 40/60, 45/55 or 50/50.

43. A pharmaceutical dosage form according to claim 41, wherein the dosage form exhibits a dissolution release profile of 80-100% amount of metformin hydrochloride after 60 minutes after oral administration.

44. A pharmaceutical dosage form according to claim 41, wherein the sub-therapeutic plasma AUC and sub-therapeutic plasma Cmax resulting from administration of the dosage form is 50% or less than the plasma AUC and Cmax resulting from administration of a single dose of GLUMETZA 500 mg.

45. A pharmaceutical dosage form according to claim 41, wherein the dosage form further comprises a DPP-IV inhibitor in (a), (b) or both.

46. A pharmaceutical dosage form according to claim 41, wherein the dosage form further comprises an antidiabetic or antiobesity agent.

47. A pharmaceutical dosage form according to claim 41, wherein the dosage form further comprises (c) an immediate release component comprising metformin hydrochloride.

48. A pharmaceutical dosage form according to claim 47, wherein the (c) immediate release component has a pH 5.0 enteric coating.

49. A pharmaceutical dosage form according to claim 47, wherein the combined amount of metformin from components (a)-(c) is less than 600 mg.

50. A pharmaceutical dosage form according to claim 41, wherein the dosage form is a bi-layer tablet.

51. A pharmaceutical dosage form according to claim 41, wherein the dosage form is a capsule with the two components as encapsulated mini-tablets.

52. A pharmaceutical dosage form comprising

(a) a pH 6.5 enterically coated immediate release component comprising metformin hydrochloride and a pharmaceutically acceptable excipient; and b) a pH 6.5 enterically coated extended release component comprising metformin hydrochloride and a pharmaceutically acceptable excipient; and

wherein the metformin hydrochloride has reduced average bioavailability.

53. A pharmaceutical dosage form according to claim 52, wherein the average systemic bioavailability is less than the average systemic bioavailability of an immediate release metformin formulation having an equivalent amount of metformin.

54. A pharmaceutical dosage form according to claim 52, wherein the average bioavailability is less than 15%.

55. A pharmaceutical dosage form according to claim 52, wherein the proportion of metformin hydrochloride in the immediate release component to the metformin hydrochloride in the extended release component is about 20/80, 30/70, 35/65, 40/60, 45/55 or 50/50.

56. A pharmaceutical dosage form according to claim 52, wherein the dosage form further comprises a DPP-IV inhibitor in (a), (b) or both.

57. A pharmaceutical dosage form according to claim 52, wherein the dosage form further comprises (c) an immediate release component comprising metformin hydrochloride.

58. A pharmaceutical dosage form according to claim 57, wherein the combined amount of metformin hydrochloride is less than 400 mg.

59. The composition according to any one of claims 1, 4, 7, 10, 13 and 16, wherein said composition is adapted to minimize the circulating plasma concentraion is below about 5 ptg/mL, 4 14/mL, 3 gg/mL, 214/mL, 1 14/mL, 0.5 ilg/mL or 0.25 ps/mL.

60. The composition according to any one of claims 1, 4, 7, 10, 13 and 16, wherein said composition is adapted to provide 60%, 50%, 40%, 30%, or 20% less relative bioavailability of the compound compared to an immediate release composition having the same amount of the compound.