CLAIMS

1. Use of a composition in the manufacture of a medicament for increasing ketone body level in a subject to cause at least one of reduction in traumatic brain injury, reduction in effect of diabetes, improvement of neurological disorder, reduction of cancer, reduction in epileptic seizure, comprising:

a dietetically or pharmaceutically acceptable carrier; and

a non-racemic mixture of R-beta-hydroxybutyrate and S-beta-hydroxybutyrate,

wherein the non-racemic mixture contains from 55% to 89% by enantiomeric equivalents of the R-beta-hydroxybutyrate and 45% to 11% by enantiomeric equivalents of the S-beta-hydroxybutyrate.

2. The use of claim 1, wherein the non-racemic mixture contains from 57% to 87% by enantiomeric equivalents of the R-beta-hydroxybutyrate and 43% to 13% by enantiomeric equivalents of the S-beta-hydroxybutyrate, or 59% to 85% by enantiomeric equivalents of the R-beta-hydroxybutyrate and 41% to 15% by enantiomeric equivalents of the S-beta-hydroxybutyrate, or 60% to 80% by enantiomeric equivalents of the R-beta-hydroxybutyrate and 40% to 20% by enantiomeric equivalents of the S-beta-hydroxybutyrate.

3. The use of claims 1 or 2, wherein the composition comprises one or more salts of R-beta-hydroxybutyrate, wherein the one or more salts of R-beta-hydroxybutyrate comprise at least one of a sodium salt, potassium salt, magnesium salt, calcium salt, transition metal salt, or amino acid salt that includes at least one amino acid or amino acid metabolite selected from arginine, lysine, leucine, isoleucine, histidine, ornithine, citrulline, glutamine, or creatine.

4. The use of any one of claims 1 to 3, wherein the non-racemic mixture contains at least one R-beta-hydroxybutyrate ester, with the proviso that the non-racemic mixture contains no more than 88%, or 87%, or 86%, or 85% by enantiomeric equivalents of (3R)-hydroxybutyl (3R)-hydroxybutyrate mono-ester.

5. The use of claim 4, wherein the R-beta-hydroxybutyrate ester comprises at least one of a diester of a diol and R-beta-hydroxybutyrate, mono-ester of ethanol, mono-ester of 1-propanol, mono-ester of 1,3-propanediol, di-ester of 1,3-propanediol, mono- or di-ester of S-1,3-butanediol, mono- or di-ester of R-1,3-butanediol, mono- or di-ester of S-R-1,3-butanediol, or mono-, di-, or tri-ester of glycerin.

6. The use of any one of claims 1 to 5, wherein the non-racemic mixture is a solid, such as a powder.

7. The use of any one of claims 1 to 6, wherein the carrier comprises a powder, a liquid, a tablet, a capsule, a food product, a food additive, a beverage, a beverage additive, or a food supplement.

8. The use of any one of claims 1 to 7, the composition further comprising vitamin D_3, such as in an amount of 5 µg to 200 µg, or 10 µg to 100 µg, or 15 µg to 75 µg, or in an amount of 200 IU to 8000 IU, or 400 IU to 4000 IU, or 600 IU to 3000 IU.

9. The use of any one of claims 1 to 8, the composition further comprising at least one medium chain fatty acid, or a mono-, di- or triglyceride of the at least one medium chain fatty acid, wherein the at least one medium chain fatty acid has from 6 to 12 carbons, or from 8 to 10 carbons.

10. The use of any one of claims 1 to 9, the composition further comprising at least one of (i) a short chain fatty acid, or a mono-, di- or triglyceride of the at least one short chain fatty acid, having less than 6 carbons or (ii) a long chain fatty acid, or a mono-, di- or triglyceride of the at least one long chain fatty acid, having more than 12 carbons.

11. Use of a composition in the manufacture of a medicament for increasing ketone body level in a subject to cause at least one of reduction in traumatic brain injury, reduction in effect of diabetes, improvement of neurological disorder, reduction of cancer, reduction of inflammation, reduction in epileptic seizure, comprising:

a non-racemic mixture of R-beta-hydroxybutyrate and S-beta-hydroxybutyrate,

wherein the non-racemic mixture contains from 55% to 89% by enantiomeric equivalents of the R-beta-hydroxybutyrate and 45% to 11% by enantiomeric equivalents of the S-beta-hydroxybutyrate, with the proviso that the non-racemic mixture contains less than 85% by enantiomeric equivalents of mono-ester of R-1,3-butanediol and R-beta-hydroxybutyrate.

12. A method for increasing ketone body level in a subject using a composition, wherein the increase in ketone body level results in at least one of appetite suppression, weight loss, fat loss, reduced blood glucose level, improved mental alertness, increased physical energy, improved cognitive function, anti-aging, antiglycation, improved mood, increased strength, increased muscle mass, or improved body composition, and wherein the composition comprises:

a dietetically or pharmaceutically acceptable carrier; and

a non-racemic mixture of R-beta-hydroxybutyrate and S-beta-hydroxybutyrate,

wherein the non-racemic mixture contains from 55% to 89% by enantiomeric equivalents of the R-beta-hydroxybutyrate and 45% to 11% by enantiomeric equivalents of the S-beta-hydroxybutyrate.

13. The method of claim 12, wherein the non-racemic mixture contains from 57% to 87% by enantiomeric equivalents of the R-beta-hydroxybutyrate and 43% to 13% by enantiomeric equivalents of the S-beta-hydroxybutyrate, or 59% to 85% by enantiomeric equivalents of the R-beta-hydroxybutyrate and 41% to 15% by enantiomeric equivalents of the S-beta-hydroxybutyrate, or 60% to 80% by enantiomeric equivalents of the R-beta-hydroxybutyrate and 40% to 20% by enantiomeric equivalents of the S-beta-hydroxybutyrate.

14. The method of claim 12 or 13, wherein the composition comprises one or more salts of R-beta-hydroxybutyrate wherein the one or more salts of R-beta-hydroxybutyrate comprise at least one of a sodium salt, potassium salt, magnesium salt, calcium salt, transition metal salt, or amino acid salt that includes at least one amino acid or amino acid metabolite selected from arginine, lysine, leucine, isoleucine, histidine, ornithine, citrulline, glutamine, or creatine.

15. The method of any one of claims 12 to 14, wherein the non-racemic mixture contains at least one R-beta-hydroxybutyrate ester, with the proviso that the non-racemic mixture contains no more than 88%, or 87%, or 86%, or 85% by enantiomeric equivalents of (3R)-hydroxybutyl (3R)-hydroxybutyrate mono-ester.

16. The method of claim 15, wherein the R-beta-hydroxybutyrate ester comprises at least one of a diol and R-beta-hydroxybutyrate, mono-ester of ethanol, mono-ester of 1-propanol, mono-ester of 1,3-propanediol, di-ester of 1,3-propanediol, mono- or di-ester of S-1,3-butanediol, mono- or di-ester of R-1,3-butanediol, mono- or di-ester of S-R-1,3-butanediol, or mono-, di-, or tri-ester of glycerin.

17. The method of any one of claims 12 to 16, wherein the non-racemic mixture is a solid, such as a powder.

18. The method of any one of claims 12 to 17, wherein the carrier comprises a powder, a liquid, a tablet, a capsule, a food product, a food additive, a beverage, a beverage additive, or a food supplement.

19. The method of any one of claims 12 to 18, the composition further comprising vitamin D_3, such as in an amount of 5 µg to 200 µg, or 10 µg to 100 µg, or 15 µg to 75 µg, or in an amount of 200 IU to 8000 IU, or 400 IU to 4000 IU, or 600 IU to 3000 IU.

20. The method of any one of claims 12 to 19, the composition further comprising at least one medium chain fatty acid, or a mono-, di- or triglyceride of the at least one medium chain fatty acid, wherein the at least one medium chain fatty acid has from 6 to 12 carbons, or from 8 to 10 carbons.

21. The method of any one of claims 12 to 20, the composition further comprising at least one of (i) a short chain fatty acid, or a mono-, di- or triglyceride of the at least one short chain fatty acid, having less than 6 carbons or (ii) a long chain fatty acid, or a mono-, di- or triglyceride of the at least one long chain fatty acid, having more than 12 carbons.

22. A method for increasing ketone body level in a subject using a composition, wherein the increase in ketone body level results in at least one of appetite suppression, weight loss, fat loss, reduced blood glucose level, improved mental alertness, increased physical energy, improved cognitive function, anti-aging, antiglycation, improved mood, increased strength, increased muscle mass, or improved body composition, and wherein the composition comprises:

a non-racemic mixture of R-beta-hydroxybutyrate and S-beta-hydroxybutyrate,

wherein the non-racemic mixture contains from 55% to 89% by enantiomeric equivalents of the R-beta-hydroxybutyrate and 45% to 11% by enantiomeric equivalents of the S-beta-hydroxybutyrate, with the proviso that the non-racemic mixture contains less than 85% by enantiomeric equivalents of mono-ester of R-1,3-butanediol and R-beta-hydroxybutyrate.