CLAIMS

What is claimed is:

1. Use of alpha-lipoic acid in the manufacture of a nutritional composition for a pediatric subject for accelerating the development of neuronal activity, the nutritional composition comprising a carbohydrate source, a fat source, a protein source, docosahexaenoic acid present in an amount of 5 mg/100 kcal to 75 mg/100 kcal of the nutritional composition, and alpha-lipoic acid present in an amount from 0.1 mg/100 kcal to 35 mg/100 kcal of the nutritional composition.
2. The use of claim 1, wherein alpha-lipoic acid is present in an amount from 10 mg/100 kcal to 20 mg/100 kcal.
3. The use of claim 1, wherein the nutritional composition further comprises sialic acid.
4. The use of claim 3, wherein sialic acid is present in an amount from 0.5 mg/100 kcal to 45 mg/100 kcals.
5. The use of claim 1, wherein the nutritional composition further comprises a prebiotic.
6. The use of claim 1, wherein the nutritional composition, when provided to the target subject, acutely affects neuronal activity patterns and strengthens electrochemical synapse connections in the target subject.
7. The use of claim 1, wherein the nutritional composition further comprises arachidonic acid.
8. The use of claim 1, wherein the nutritional composition is an infant formula.
9. Use of alpha-lipoic acid in the manufacture of a nutritional composition for a pediatric subject for accelerating the development of neuronal activity, the nutritional composition comprising per 100 kcal:
    (i) between 6 g and 22 g of a carbohydrate source;
    (ii) between 1 g and 7 g of a protein source;
    (iii) between 1.3 g and 7.2 g of a fat source;
    (iv) between 5 mg and 75 mg of docosahexaenoic acid; and
    (iv) between 0.1 mg and 35 mg of alpha-lipoic acid.
10. The use of claim 9, wherein the nutritional composition further comprises per 100 kcal between 0.3 g and 1.2 g of prebiotic.

11. The use of claim 9, wherein the nutritional composition further comprises per 100 kcal between 0.5 mg and 45 mg of sialic acid.
12. The use of claim 9, wherein the nutritional composition further comprises per 100 kcal between 10 mg and 250 mg of lactoferrin.
13. The use of claim 9, wherein the nutritional composition further comprises a culture supernatant from a late-exponential growth phase of a probiotic batch-cultivation process.