CLAIMS

What is claimed is:

1. An alternative dairy food composition comprising:

A) a plant-expressed recombinant fusion protein comprising:

(i) a first casein milk protein; and

(ii) a second casein milk protein and/or a zein protein; and

B) at least one lipid.

2. The alternative dairy food composition of claim 1, wherein the first casein milk protein and/or the second casein milk protein is a protein selected from the group consisting of α-S1 casein, α-S2 casein, β-casein, κ-casein, and para-κ-casein.

3. The alternative dairy food composition of claim 1, wherein the alternative dairy food composition does not comprise any non-transgenic animal milk proteins.

4. The alternative dairy food composition of claim 1, wherein the alternative dairy food composition does not comprise any non-casein animal milk proteins.

5. The alternative dairy food composition of claim 1, which comprises calcium at a concentration of about 0.01 to about 2% by weight.

6. The alternative dairy food composition of claim 1, comprising a total amount of casein protein;

wherein about 32% to 100% by weight of the total amount of casein protein in the alternative dairy food composition is beta-casein.

7. The alternative dairy food composition of claim 1, wherein the composition has a pH of about 5.2 to about 5.9.

8. The alternative dairy food composition of claim 1, wherein the plant-expressed recombinant fusion protein confers on the alternative dairy food composition one or more characteristics of a dairy food product selected from the group consisting of: taste, aroma, appearance, handling, mouthfeel, density, structure, texture, elasticity, springiness, coagulation, binding, leavening, aeration, foaming, creaminess, and emulsification.

9. The alternative dairy food composition of claim 1, which is selected from the group consisting of: cheese and processed cheese products, yogurt and fermented dairy products, directly acidified counterparts of fermented dairy products, cottage cheese dressing, frozen dairy products, frozen desserts, desserts, baked goods, toppings, icings, fillings, low-fat spreads, dairy-based dry mixes, soups, sauces, salad dressing, geriatric nutrition, creams and creamers, analog dairy products, follow-up formula, baby formula, infant formula, milk, dairy beverages, acid dairy drinks, smoothies, milk tea, butter, margarine, butter alternatives, growing up milks, low-lactose products and beverages, medical and clinical nutrition products, protein/nutrition bar applications, sports beverages, confections, meat products, analog meat products, meal replacement beverages, weight management food and beverages, cultured buttermilk, sour cream, yogurt, skyr, leben, lassi, kefir, powder containing a milk protein, and low-lactose products.

10. The alternative dairy food composition of claim 1, which is a cheese composition.

11. The alternative dairy food composition of claim 10, wherein the cheese has the ability to stretch to at least 3 cm in length without breaking, as determined by heating a 100 gram mass of the cheese to a temperature of about 225°C for 4 minutes and cooling to about 90°C and pulling with a fork placed beneath the mass.

12. The alternative dairy food composition of claim 1, wherein the alternative dairy food composition has at least one characteristic that is substantially similar to bovine milk selected from taste, appearance, mouthfeel, structure, texture, density, elasticity, springiness, coagulation, binding, leavening, aeration, foaming, creaminess, and emulsification.

13. The alternative dairy food composition of claim 1, wherein the first casein milk protein and/or the second milk protein is κ-casein and comprises the sequence of SEQ ID NO: 4, or a sequence at least 90% identical thereto.

14. The alternative dairy food composition of claim 1, wherein the first casein milk protein and/or the second casein milk protein is para-κ-casein and comprises the sequence of SEQ ID NO: 2, or a sequence at least 90% identical thereto.

15. The alternative dairy food composition of claim 1, wherein the first casein milk protein and/or the second casein milk protein is β-casein and comprises the sequence of SEQ ID NO: 6, or a sequence at least 90% identical thereto.

16. The alternative dairy food composition of claim 1, wherein the first casein milk protein and/or the second casein milk protein is α-S1 casein and comprises the sequence SEQ ID NO: 8, or a sequence at least 90% identical thereto.

17. The alternative dairy food composition of claim 1, wherein the first casein milk protein and/or the second casein milk protein is α-S2 casein and comprises the sequence SEQ ID NO: 84, or a sequence at least 90% identical thereto.

18. The alternative dairy food composition of claim 1, wherein the first casein milk protein and the second casein milk protein are different.

19. The alternative dairy food composition of claim 1, wherein the first casein milk protein and the second casein milk protein are the same.

20. The alternative dairy food composition of claim 1, wherein the first casein milk protein and/or the second casein milk protein is α-S1 casein.

21. The alternative dairy food composition of claim 1, wherein the first casein milk protein and/or the second casein milk protein is α-S2 casein.

22. The alternative dairy food composition of claim 1, wherein the first casein milk protein and/or the second casein milk protein is β-casein.

23. The alternative dairy food composition of claim 1, wherein the first casein milk protein and/or the second casein milk protein is κ-casein.

24. The alternative dairy food composition of claim 1, wherein the first casein milk protein and/or the second casein milk protein is para-κ-casein.

25. The alternative dairy food composition of claim 1, wherein the first casein milk protein is β-casein and the second casein milk protein is β-casein.

26. The alternative dairy food composition of claim 1, wherein the first casein milk protein is β-casein and the second milk protein is α-S1 casein or α-S2 casein.

27. The alternative dairy food composition of claim 1, wherein the first casein milk protein is α-S1 casein or α-S2 casein and the second milk protein is α-S1 casein or α-S2 casein.

28. The alternative dairy food composition of claim 1, wherein the first casein milk protein is κ-casein or para-κ-casein and the second milk protein is β-casein.

29. The alternative dairy food composition of claim 1, wherein the alternative dairy food composition does not comprise an organoleptically functional amount of β-lactoglobulin.

30. The alternative dairy food composition of claim 1, wherein the zein protein is selected from the group consisting of α zein, β zein, δ zein, and γ zein.