CLAIMS

1. A micelle-like composition comprising a kappa casein in the absence of alpha casein and beta casein, wherein the kappa casein forms a micelle-like structure.

2. The micelle-like composition of claim 1, wherein the kappa casein comprises intra-micellar crosslinking between kappa casein molecules.

3. The micelle-like composition of claim 1 or claim 2, wherein the kappa casein has an amino acid sequence comprising any one of SEQ ID NOs: 40-60, or a variant thereof comprising an amino acid sequence with at least 80% sequence identity to any one of SEQ ID NOs: 40-60.

4. The micelle-like composition of any one of claims 1-3, wherein the kappa casein comprises an amino acid sequence of cow, human, sheep, goat, buffalo, bison, horse, or camel kappa casein protein.

5. The micelle-like composition of any one of claims 1-4, wherein the kappa casein comprises a first kappa casein protein and a second kappa casein protein, and optionally wherein the first kappa casein and/or the second kappa casein is a truncated form of a kappa casein.

6. The micelle-like composition of any one of claims 1-5, wherein the micelle-like composition comprises a population of micelle-like structures with an average or mean size from about 150 nm to about 700 nm.

7. The micelle-like composition any one of claims 1-6, further comprising at least one salt selected from the group consisting of a calcium salt, a citrate salt, and a phosphate salt.

8. A dairy-like product derived from the micelle-like composition of any one of claims 1-7.

9. The dairy-like product of claim 8, wherein the micelle-like composition does not include any additional dairy protein other than the kappa casein.

10. The dairy-like product of claim 8 or claim 9, wherein the dairy-like product is selected from the group consisting of milk, yogurt, curd, cheese, cream, and ice cream.

11. The dairy-like product of claim 10, wherein the dairy-like product comprises a cheese selected from the group consisting of a soft cheese, a hard cheese, a pasta filata cheese, and an aged cheese.

12. The dairy-like product of claim 10 or claim 11, wherein the cheese is capable of one or more of stretching when heated and melting when heated.

13. A dairy-like product comprising the micelle-like composition of any one of claims 2-7, wherein the dairy-like product has a yield, melt, and/or stretch that is improved as compared to a comparable dairy-like product without the intra-micellar crosslinking between kappa casein molecules.

14. A method of making a dairy-like ingredient comprising providing a kappa casein in the absence of any alpha casein or beta casein under conditions such that the kappa casein forms a micelle-like structure in a form suitable for a dairy-like ingredient.

15. The method of claim 14, further comprising, providing a crosslinking agent under conditions for crosslinking the kappa casein, wherein the micelle-like structure comprises intra-micellar crosslinking between kappa casein molecules.

16. The method of claim 15, wherein the cross-linking agent is inactivated after formation of the micelle-like structures.

17. The method of claim 15 or claim 16, wherein the cross-linking agent comprises transglutaminase.

18. A micelle composition comprising an alpha casein and a kappa casein, wherein at least one of the alpha casein and the kappa casein is a recombinant protein, wherein the alpha casein, the kappa casein, or both the alpha casein and the kappa casein comprise a non-native post-translational modification feature, and wherein the alpha casein and the kappa casein are associated in micelles, and wherein the micelles lack beta casein.

19. A method of making the micelle composition of claim 18, comprising:

(a) providing the alpha casein and the kappa casein;

(b) inducing micelle formation; and

(c) providing a crosslinking agent under conditions for inducing intra-micellar crosslinking, wherein the method produces micelles comprising the alpha casein and the kappa casein.

20. A method of making the micelle composition of claim 18, comprising:

(a) providing the alpha casein, wherein the alpha casein comprises a non-native posttranslational modification feature;

(b) providing a crosslinking agent under conditions for crosslinking the alpha casein; and

(c) mixing the kappa casein with the crosslinked alpha casein under conditions to induce micelle formation, wherein the method produces micelles comprising the alpha casein and the kappa casein.