What is claimed is:

1. A fibroin-derived protein composition that possesses enhanced stability in an aqueous solution, wherein:

the primary amino acid sequences of the fibroin-derived protein composition differ from native fibroin by at least by at least 4% with respect to the combined amino acid content of serine, glycine, and alanine;

cysteine disulfide bonds between the fibroin heavy and fibroin light protein chains of fibroin are reduced or eliminated;

the composition comprises greater than 46.5% glycine amino acids and greater than 30% alanine amino acids,

the composition has a serine content that is reduced by greater than 40% compared to native fibroin protein such that the composition comprises less than 8% serine amino acids; and

wherein the average molecular weight of the fibroin-derived protein composition is less than about 100 kDa.

2. The protein composition of claim 1 wherein the protein composition has an aqueous viscosity of less than 4 mPa•s (4 cP) as a 10% w/w solution in water.

3. The protein composition of claim 1 wherein the protein composition has an aqueous viscosity of less than 10 mPa•s (10 cP) as a 24% w/w solution in water.

4. The protein composition of claim 1 wherein the protein composition is soluble in water at 40% w/w without precipitation.

5. The protein composition of claim 1 wherein the protein composition does not gel upon ultrasonication of an aqueous solution of the protein composition at concentrations of up to 10% w/w.

6. The protein composition of any one of claims 1-5 wherein the protein composition comprises less than 6% serine amino acid residues.

7. The protein composition of any one of claims 1-5 wherein the protein composition comprises greater than 48% glycine amino acids.

8. The protein composition of any one of claims 1-5 wherein the protein composition comprises greater than 31.5% alanine amino acids.

9. The protein composition of any one of claims 1-5 wherein the protein composition completely re-dissolves in water after being dried to a thin film; or

wherein the protein composition lacks beta-sheet protein structure in aqueous solution; or

wherein the protein composition maintains an optical absorbance in aqueous solution of less than 0.25 at 550 nm after at least five seconds of ultrasonication.

10. The protein composition of any one of claims 1-5 in combination with water, wherein the protein composition completely dissolves in the water at a concentration of 40% w/w.

11. The fibroin-derived protein composition of any one of claims 1-5 wherein the primary amino acid sequences of the fibroin-derived protein composition differ from native fibroin by at least by at least 6% with respect to the combined difference in serine, glycine, and alanine content; the average molecular weight of the fibroin-derived protein is less than about 100 kDa and greater than about 30 kDa; and the fibroin-derived protein composition maintains an optical absorbance at 550 nm of less than 0.25 for at least two hours after five seconds of ultrasonication.

12. The protein composition of any one of claims 1-11 obtainable by a process comprising

heating an aqueous fibroin solution at an elevated pressure,

wherein the aqueous fibroin solution comprises lithium bromide at a concentration of at least 8M, and

wherein the aqueous fibroin solution is heated to at least about 105 ^{o}C (221 ^{o}F) under a pressure of at least about 68.95kPa (10 PSI) for at least about 20 minutes;

to provide the protein composition,

wherein the protein composition comprises less than 8.5% serine amino acid residues and the protein composition has an aqueous viscosity of less than 5 mPa•s (5 cP) as a 10% w/w solution in water; and

wherein the protein composition comprises peptide chains that terminate in amide (-C(=O)NH_2) groups.

13. A process for preparing a protein composition of any one of claims 1-11, the process comprising

heating an aqueous fibroin solution at an elevated pressure,

wherein the aqueous fibroin solution comprises lithium bromide at a concentration of at least 8M, and

wherein the aqueous fibroin solution is heated to at least about 105 ^oC (221 ^oF) under a pressure of at least about 68.95kPa (10 PSI) for at least about 20 minutes;

to provide the protein composition, wherein the protein composition comprises less than 8.5% serine amino acid residues and the protein composition has an aqueous viscosity of less than 5 mPa•s (5 cP) as a 10% w/w solution in water.

14. The process of claim 13, wherein the protein composition comprises peptide chains that terminate in amide (-C(=O)NH_2) groups.

15. A food or beverage composition or an eye drop formulation comprising the protein composition of claim 1 or the protein composition prepared by the process of claim 13, and a food or beverage component or an eye drop formulation component.