WHAT IS CLAIMED IS:

1. A process for manufacturing an extruded nutritional powder, the process comprising:

introducing water into an extruder;

introducing a dry blend comprising at least a portion of a protein and, optionally, a portion of a carbohydrate into the extruder;

introducing an oil blend comprising fat into the extruder;

mixing the dry blend and oil blend to form an emulsified mixture within the extruder and extruding the emulsified mixture to form an extrudate;

drying the extrudate; and

forming a powder from the dried extrudate.

2. The process of claim 1 wherein the dry blend, water, and oil blend are held within the extruder for a total time period of from about 30 seconds to about 300 seconds.

3. The process of claim 1 further comprising dryblending an optional ingredient with the dried extrudate subsequent to forming a powder from the dried extrudate.

4. The process of claim 1 wherein the extruder is a co-rotating twin screw extruder.

5. The process of claim 1 wherein the drying is done using a vacuum dryer.

6. The process of claim 5 wherein the drying is done using a continuous vacuum dryer.

7. The process of claim 1 wherein the extruded nutritional powder is selected from the group consisting of a soy based-extruded nutritional powder, a lactose-free extruded nutritional powder, a rice-starch based extruded nutritional powder, a milk protein-based extruded nutritional powder, a protein hydrolysate-based extruded nutritional powder, and combinations thereof.

8. A process for manufacturing an extruded nutritional powder, the process comprising:

introducing water into an extruder;

introducing a dry blend comprising at least a portion of one protein and optionally, at least a portion of a carbohydrate into the extruder and hydrating the dry blend;

introducing an oil blend comprising at least a portion of one fat into the extruder;

mixing the hydrated dry blend and oil blend to form an emulsified mixture within the extruder, wherein water comprises less than 22% by weight of total emulsified mixture;

extruding the emulsified mixture to form an extrudate;

drying the extrudate; and

grinding the dried extrudate into a nutritional powder.

9. The process of claim 8 wherein water comprises less than 14% by weight of total dry blend, water, and oil blend.

10. The process of claim 1 or 8 wherein the dry blend comprises protein and carbohydrate.

11. The process of claim 1 or 8 wherein the dry blend further comprises vitamins, minerals, or both.

12. The process of claim 1 or 8 wherein the dry blend, water, and oil blend are mixed and emulsified at a temperature range of from about 25°C to about 100°C.

13. The process of claim 8 wherein the dry blend, water, and oil blend are held within the extruder for a total time period of from about 30 seconds to about 300 seconds.

14. The process of claim 1 or 8 wherein the dry blend additionally includes an ingredient selected from the group consisting of minerals, citrates, a protein hydration aid, from 1% to 3% by weight of the total oil, and combinations thereof.

15. A process for manufacturing an extruded nutritional powder, the process comprising:

introducing water into an extruder;

introducing at least a portion of a protein into the extruder;

introducing an oil blend comprising fat into the extruder;

introducing a carbohydrate into the extruder;

mixing and emulsifying the protein, water, oil blend, and carbohydrate within the extruder to form an emulsified mixture and extruding the emulsified mixture to form an extrudate;

drying the extrudate; and

grinding the dried extrudate into a nutritional powder.

16. The process of claim 15, further comprising adding vitamins, minerals, or both, to the extruder.

17. The process of claim 15 wherein the protein, water, oil blend, and carbohydrate are mixed and emulsified at a temperature range of from about 25°C to about 100°C.

18. The process of claim 15 wherein the protein, water, oil blend, and carbohydrate are held within the extruder for a total time period of from about 30 seconds to about 300 seconds.

19. The process of claim 1, 8, or 15 comprising drying the extrudate at a temperature of from about 80°C to about 160°C.

20. The process of claim 8 or 15 further comprising dryblending an optional ingredient with the dried extrudate subsequent to grinding the dried extrudate into a nutritional powder.

21. The process of claim 1, 8 or 15 further comprising dryblending at least one ingredient.

22. The process of claim 21 wherein the at least one ingredient is selected from the group consisting of probiotics, encapsulated PUFAs, and combinations thereof.

23. An extruded powder comprising fat, carbohydrate, and protein, wherein the extruded powder, upon reconstitution with water, shows substantially no fat separation at 24 hours.

24. An extruded powder comprising fat, carbohydrate, and protein, wherein the extruded powder, upon reconstitution with water, shows substantially no creaming defect at 24 hours.

25. The process of claim 1, 8, or 15 wherein the extrudate is dried to a moisture content of between about 0.75% to about 5%.

26. The process of claim 25, wherein a vacuum belt dryer is used in the drying step.

27. The process of claim 26, wherein the extrudate is dried for a period of about 5 to about 45 minutes.

28. The process of claim 25, wherein a vacuum drum dryer is used in the drying step.

29. The process of claim 28, wherein the extrudate is dried for a period of about 15 to about 90 seconds.

30. The process of claim 25, wherein a continuous microwave dryer is used in the drying step.

31. The process of claim 30, wherein the extrudate is dried for a period of about 5 to about 20 minutes.

32. The process of claim 25, further comprising reconstituting the powder to a ready-to-feed state.

33. The process of claim 31, wherein said powder, when reconstituted, forms a stable emulsion.

34. The process of claim 1, 8, or 15 wherein the extrudate is dried for a period of about 5 minutes to about 45 minutes using a vacuum belt dryer to produce a nutritional composition, wherein said nutritional composition forms a stable emulsion upon reconstitution.

35. The process of claim 34, wherein the drying step is performed at a pressure of about 20 mbar to about 50 mbar.

36. The process of claim 34, wherein the drying step is performed at a temperature of about 100°C to about 170°C.

37. A nutritional composition comprising at least one of a fat, protein, and carbohydrate, and at least one vitamin, mineral, or other nutrient, or combination thereof, made according to the process of claim 25.

38. The nutritional composition of claim 37, wherein said composition comprises from about 10% to about 18% protein; from about 30% to about 54% carbohydrate; and from about 24% to about 50% fat.

39. The nutritional composition of claim 37, wherein said composition comprises from about 54 to about 140 gm/l of carbohydrate, from about 20 to about 54 gm/l of fat, and from about 7 to about 40 gm/l of protein.

40. The nutritional composition of claim 37, wherein said composition is reconstituted to a ready-to-feed state and wherein said composition forms a stable emulsion upon reconstitution.

41. The nutritional composition of claim 37, wherein the composition is prepared by forming an emulsion within the extruder and then extruding the mixture.

42. The nutritional composition of claim 37, wherein the composition is dried using a vacuum belt dryer.

43. The nutritional composition of claim 42, wherein the composition is dried for a period of about 25 minutes, at a pressure of about 20 mbar to about 50 mbar, and at a temperature of about 100°C to about 170°C.

WHAT IS CLAIMED IS:

1. A process for manufacturing an extruded nutritional powder, the process comprising the steps in the following order:

introducing a dry blend comprising at least a portion of a protein and, optionally, a portion of a carbohydrate into an extruder;

introducing water into the extruder either prior to or after introducing the dry blend into the extruder;

introducing an oil blend comprising fat into the extruder;

mixing the dry blend, water, and oil blend to form an emulsified mixture within the extruder;

extruding the emulsified mixture to form an extrudate;

drying the extrudate; and

forming a nutritional powder from the dried extrudate.

2. The process of claim 1 wherein the dry blend, water, and oil blend are held within the extruder for a total time period of from about 30 seconds to about 300 seconds.

3. The process of claim 1 further comprising dryblending at least one ingredient with the dried extrudate subsequent to forming a nutritional powder from the dried extrudate.

4. The process of claim 3 wherein the at least one ingredient is selected from the group consisting of probiotics, encapsulated PUFAs, and combinations thereof.

5. The process of claim 1 wherein the extruded nutritional powder is selected from the group consisting of a soy-based extruded nutritional powder, a lactose-free extruded nutritional powder, a rice starch-based extruded nutritional powder, a milk protein-based extruded nutritional powder, a protein hydrolysate-based extruded nutritional powder, and combinations thereof.

6. The process of claim 1 wherein water comprises less than 22% by weight of total dry blend, water, and oil blend.

7. The process of claim 1 wherein the dry blend further comprises carbohydrate, vitamins, minerals, or-combinations thereof.

8. The process of claim 1 wherein the dry blend, water, and oil blend are mixed and emulsified at a temperature range of from about 25°C to about 100°C.

9. The process of claim 1 comprising drying the extrudate at a temperature of from about 80°C to about 160°C.

10. The process of claim 1 wherein the extrudate is dried to a moisture content of between about 0.75% to about 5%.

11. The process of claim 1 wherein the extrudate is dried for a period of about 5 minutes to about 45 minutes using a vacuum belt dryer to produce a nutritional powder, wherein said nutritional powder forms a stable emulsion upon reconstitution.

12. The process of claim 11, wherein the drying step is performed at a pressure of about 20 mbar to about 50 mbar and at a temperature of about 100°C to about 170°C.

13. An extruded nutritional powder comprising protein, carbohydrate, and fat, and at least one of a vitamin, a mineral, another nutrient, or combinations thereof, made according to the process of claim 1.

14. The extruded nutritional powder of claim 13, wherein the extruded nutritional powder is dried using a vacuum belt dryer for a period of from 5 minutes to 45 minutes, at a pressure of about 20 mbar to about 50 mbar, and at a temperature of about 100°C to about 170°C.

15. The extruded nutritional powder of claim 13, wherein the extruded nutritional powder, upon reconstitution with water, shows substantially no fat separation at 24 hours, or shows substantially no creaming defect at 24 hours.