protein and, optionally, a carbohydrate into the extruder and hydrating the dry blend, introducing an oil blend comprising a 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.

[0011] The present disclosure is further directed to a process for manufacturing an extruded nutritional powder. The process comprises introducing water into an extruder, introducing a protein into the extruder, introducing an oil blend comprising a 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. In some aspects, the process includes introducing a vitamin, mineral, amino acid, and active component (*e.g.*, polyphenols, CaHMB, flavors, color) prior to mixing.

[0012] The present disclosure is further directed to 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 as described herein.

[0012a] The present disclosure is further directed to an extruded powder comprising fat, carbohydrate, and protein, wherein the extruded powder, upon reconstitution with water, shows substantially no fat separation at 24 hours.

[0013] The present disclosure is further directed to an extruded powder comprising fat, carbohydrate, and protein, wherein the extruded powder, upon reconstitution with water, shows substantially no creaming defect at 24 hours.

[0014] The disclosure is further directed to methods for reducing the loss of a heat labile vitamin in a powdered nutritional product using the disclosed extrusion processes. The heat labile vitamins may include vitamin A, vitamin D, vitamin E, vitamin K, pantothenic acid, vitamin C, thiamine, folic acid, riboflavin, vitamin B12, biotin, and combinations thereof. The methods include the use of the disclosed extrusion methods to produce full nutrition products while avoiding the need for overfortification of the product.