

# Development of a Pulse-Based Protein Drink Mix for Vegan Athletes

Pea protein combined with quinoa flour creates a vegan smoothie dry mix with 20 grams of protein per serving.

**VEGAN ATHLETES REQUIRE** adequate amounts of protein to meet their dietary needs and maximize their athletic performance; however, this can be a challenge as their diet excludes any animal or animal-derived protein sources (e.g. meat, fish, dairy, eggs). These traditional animal sources are complete proteins, meaning they contain all essential amino acids. In contrast, plant derived-proteins are incomplete proteins and most are limited in lysine, threonine, tryptophan or sulphur-containing amino acids. To achieve a complete protein ratio, pulses and cereal proteins can be combined as they contain complementary set of amino acids. This study looked to develop a vegan dry smoothie mix that contains 15–25 grams of high-quality protein. For marketability, the mix also could not contain artificial flavours or colours and be easy to blend and drink.

Pea protein was selected as the pulse protein source due to its widespread availability, low cost and amino acid content. Pea protein contains lysine, which increases calcium absorption, and

threonine, which helps with muscle and tissue strength and elasticity. Quinoa flour was chosen as the cereal protein source as it is the only cereal that is a complete protein and its taste masks the beany off-flavours of the pea protein. To increase palatability, a blend of cane sugar and stevia was added for sweetness and two flavours, vanilla-chai and chocolate were created (see below).

One serving of each of the dry mixes (42 grams for vanilla-chai and 46 grams for chocolate) contained 20 grams of protein. Allowable nutrient claims for the smoothie mix included source of energy, trans fat free, cholesterol free, a source of magnesium and molybdenum, a good source of calcium and an excellent source of iron and phosphorus.

To prepare the smoothie, sensory panels tested water, almond milk, soy milk and coconut as possible hydrating agents. All were deemed acceptable, but testers preferred almond and soy milk. The panel described the smoothies as *refreshing, smooth textured, no lumps, easily dissolved, sweet and appealing*.

The availability of a delicious, good quality vegan protein dry mix with a full amino acid profile that is easily incorporated in smoothies may reduce health care costs and provide a well-researched and practically conceived product for sports dietitians, nutritionists and other exercise science and medicine experts. These experts recognize the importance of nutrition for optimal performance as well as the difficulties in implementing sports nutrition for vegan athletes. The creation of a high protein dry mix can provide a value added product for Manitoba food processors and can be used to promote and market pulse ingredients to the food industry.

The project industry partner, Jordan Ciciewa of One Fit City (Winnipeg, MB) is actively marketing the product through website, radio and TV promotions. Several local juice stores and yoga, spin and Barre fitness studios have tested selling the product and are excited to retail a made-in-Manitoba product. The final product, with all the required labelling will be available in early 2017. ▶

Vanilla chai dry protein mix (left) and chocolate protein smooth formulation (right) both made from pea protein powders.



**PRINCIPAL INVESTIGATOR** Meeling Nivet, Food Development Centre

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**DURATION** 1 year