

# PUM' CRISPS

P<sup>2</sup>: *“Healthy has never been so tempting!”*

Visit our webpage: <http://.pulsepomace.wix.com/pulsepomace>

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**Project Introduction.** Our product began as a project in Dr. Karboune's class at the Macdonald Campus of McGill University in September 2015. Once we had developed our concept, we entered Pulse Canada's Mission ImPULSEible. In January 2016, we were selected as the winner of the Quebec division and were given the opportunity to showcase our product at CIFST's biannual conference in Vancouver, British Columbia. Although we were not selected as winners at this final competition, we were invited to present our product at McGill's Convergent Innovation Conference in March 2016 along with many leaders of the food industry.

**Funds for Success.** The funding provided to us was vital to our success. With this money, we were able to purchase the necessary ingredients and equipment (juicer, dehydrator, and vacuum sealer) required to develop the product to its full potential. Our product incorporates pomace, a by-product of the food industry, into a nutrient dense and delicious crisp. However, we were not able to source all of our pomaces from companies as our required quantities were much too low. This allowed us to make a wide variety of pomaces which we tested in our product and also allowed us to make our own beet juice. Dehydration was a key processing step for our product; it allowed us to produce a crispy texture all while maintaining a healthy profile. Hence, our product is much healthier than its competitors such as vegetable chips which are often fried. After performing our initial testing with an oven, we realized that the temperature was too high which resulted in the undesirable caramelization of our product. Finally, the vacuum sealer was purchased once we were selected as the winner of the Quebec division. As our product is crispy, good texture was extremely important to our product's profile. This equipment allowed us to prepare the product before our travels to Vancouver, while conserving its freshness. The remainder of the money was used to cover travel expenses (plane and hotel) in order to compete in the national competition.

**Product Overview.** At P<sup>2</sup>, *Healthy Has Never Been So Tempting*. Our product, *Pum' Crisps*, combines the deliciousness of apples and cranberries, the vibrancy of beets, and the healthiness of pulses to bring innovation to the snack market. Wholesome lentil and chickpea flours are mixed with pomace and pea protein for a dense snack. For a touch of indulgence, the crisps are covered in a scrumptious chocolate drizzle enriched with pea protein for a total pulse content of more than 65%.

**Incorporation of Pulses and Celebration of IYOP.** Our company was founded in response to the United Nations' announcement that 2016 would be the International Year of Pulses. Our brand is centered around pulses, with their use in all of our line and brand extensions. At P<sup>2</sup>, we strongly believe that pulses are underutilised as they are a cost effective and environmentally sustainable source of nutrients. However, while pulses have an abundance of nutritional benefits, Canadians are either not in the habit of consuming them or dislike their taste. We thus decided to introduce pulses into the Canadian diet by incorporating them into a popular product platform that does not currently contain pulses. Specifically, we have incorporated pulses into an innovative sweet snack.

**Technical Challenges.** Incorporating pulses into our product proved challenging. Pulse flours excessively pale the crisps; beet juice provides a natural and vivacious colour. To reduce colour loss, the crisps are dehydrated before baking. The pulse flours produce off-notes, while pea protein provides undue bitterness. This is resolved by an optimal ratio between two natural flavours as well as the addition of ascorbic and citric acids which enhance fruitiness. To reduce the batter's grainy texture, the pulse flours are pre-gelatinized with the wet ingredients. For extra crispiness, the apple pomace was removed as its high pectin content readily binds and retains moisture. Our optimal drying method also helps produce a desirable texture. First, microwave drying forces the internal water molecules to the surface. Afterwards, the crisps are dehydrated and then baked.

**Health Potential.** The high concentrations of nutrients that make *Pum' Crisps* a high satiety, 100-calories-per-serving snack are due to the incorporation of pomace and, most importantly, pulses. Per 37g serving, *Pum' Crisps* contain 2g of dietary fiber and 6g of protein, as well as a low fat content of 1.5g. Additionally, our product has no trans-fat or cholesterol, and is low in salt (10mg). Besides being rich in antioxidants (due to cranberry and beet), it is also a source of iron and an excellent source of folate and vitamin C, providing 8%, 30% and 100% of the daily values, respectively. To remove anti-nutritive compounds which can inhibit mineral absorption, the purchased pulse flours will have undergone a soaking treatment to be free of phytates. Moreover, *Pum' Crisps* is vegetarian friendly, and contains no artificial colours or flavours. The final formulation of *Pum' Crisps* contains beet juice, cranberry by-product (sugar, cranberry),

lentil flour, chickpea flour, beet pomace, semi-sweet chocolate, pea protein, natural apple flavour, natural flavour, citric acid and ascorbic acid.

**Packaging.** At P<sup>2</sup>, we strive for sustainability not only with our ingredients, but also our packaging. *Pum' Crisps* are packaged in a compostable, bi-layered polylactic acid (PLA) bag. The inner layer protects the product from external contaminants and moisture, while the outer layer features attractive graphics to sell what it protects. To avoid product oxidation and to provide physical protection, the bag is flushed with nitrogen before being sealed.

**Marketing Plan.** *Pum' Crisps* are marketed to young adults who are already snackers, are willing to try new products and are environmentally and health-conscious; a consumer study showed a 75% acceptance by our targeted consumers. The cost of producing 1 single serving bag of *Pum' Crisps* is \$0.43, including cost of ingredients, packaging, marketing, transportation, energy and labour. A box of six packages will be sold (for \$5.78) in health food stores as well as in the health-oriented aisles of regular grocery stores, as consumers that shop in these locations are willing to pay more for high quality products. At Costco, *Pum' Crisps* will be available in boxes of 20 packages for \$15.84. Due to its single serving packaging which helps with portion control, our product will also be sold in vending machines, coffee shops and gas stations, for \$1.28, to offer customers a filling, on-the-go snack.

Thank you for your support towards our project with SEEF funding!



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