I. Project Title: The National Dairy Council® New Product Competition: Developing Novel Performance Nutrition Beverage Using Dairy Protein Ingredients

II. Project Completion Date: December 15th, 2019

III. Student(s), Department(s), and Major(s)

(1) Tina Truong, FSN Department, Food Science (BS)

(2) Patricia Lai, ASCI Department, Dairy Products Technology (MPS)

IV. Faculty Advisor and Department
Dr. Haoan Zheng, ASCI

V. Cooperating Industry, Agency, Non-Profit, or University Organization(s)
Cal Poly Dairy Innovation Institute

VI. Executive Summary
According to "Statista" and "GlobalData" marketing research reports, the value of U.S. Sports Nutrition Market is forecasted to reach $21 billion; 39% of American adults and an additional 36% of consumers are in the market for food and beverage products targeted towards fitness. This market project stimulates growth for the dairy industry and the domestic market demand provides reason to develop more inclusions of dairy proteins in sports nutrition products. An ambient stable, ready to drink (RTD), high protein beverage is ideal in catering towards not only the targeted group of consumers, but anyone that is looking for convenience in their lifestyle. A low calorie fermented dairy beverage as prototyped product was designed by the student team, and it was manufactured at the Dairy Innovation Institute using pilot-plant facilities. The name of the prototyped product is "Pro-Tea". "Pro-Tea" is a nutrient dense, ultra-high temperature (UHT) processed high protein yogurt drink that combines the health benefits of dairy protein, honey, and tea to optimize active performance nutrition. If the product is aseptically packed, it may be considered as ready to drink, and shelf-stable product. Made with non fat dry milk, micellar casein concentrate, erythritol, a stabilizer bundle system and yogurt culture, the product contains increased protein content. Pro-Tea is designed to achieve optimum exercise, muscle-building, and fitness performance. Pro-Tea is an outstanding source of dairy protein and provides 28 grams dairy protein per serving (473 ml).
One serving provides more than 20% of the Dietary Reference Intake for protein and it is eligible to use “REAL® seal” (more than 5% protein content). The fortified natural tea extracts in Pro-Tea will supply an antioxidant and caffeine content, giving an enlivening burst of energy for consumers who may need a convenient on-the-go snack to meet the demands of any given situation such as pre or post workout. Pro-Tea does not contain any artificial colors, and preservatives, making it better aligned to the body’s needs. No conventional sugar was used in the product and only low calorie sweetener was included in the formula, the product may be considered as relatively low calorie, high protein yogurt drink. The product is designed for meeting food labeling and any related regulatory criteria as specified by the Code of Federal Regulations.

As for the new high dairy protein product made with the additional funds, Dairy Gainz was created. Dairy Gainz is a bite-sized, dairy and plant-based cracker flavored with aged cheeses. Inspired by the classic cheese puff, this cracker is an umami flavored crunchy snack. The cracker is made of milk protein concentrate (MPC), oat flour, flaxseed meal, aged gouda, aged cheddar, and sunflower oil. The snack combines the health benefits of both dairy and plant-based ingredients to make a nutritious and excellent protein source without the use of any artificial flavors or preservatives. Dairy Gainz are vegetarian-friendly, gluten-free, and have a high potential for future line extensions. Due to its shelf stability, the crackers’ design may appeal to people who travel, families, or anyone else who may be looking for a convenient, high-protein snack. The product was made over a span of five months.

VII. Major Accomplishments

1. Optimizing stabilizer addition rate

2. Increased protein content compared to conventional UHT yogurt drink in the market

3. Established bench scale platform for making yogurt drink samples at the Dairy Innovation Institute


5. Tina Truong, BS, FSN student formed another team in 2019 Fall. The new team created a new prototyped product "Dairy Gainz". It is a dairy-plant hybrid cracker snack. One cracker is composed of

6. roughly 54% dairy and contains 11.19 g of dairy protein, out of 13.14 g total protein, per 30 g serving size. The preliminary report for this prototyped product has been just submitted to the National Dairy Council for the New Product Development Competition 2020.

VIII. Expenditure of Funds

Funds were spent on ingredients, laboratory scale equipment to produce yogurt, and compensation for sensory testing for participants.

IX. Impact on Student Learning

Students on the project bolstered their skills in data analysis, laboratory practice, manufacturing practice, managing R&D activities for product formulation, and presentation of research results. The students acquired leadership skills in being able to take ownership of a project through this hands on learning opportunity.