Soy Based Nutrient Dense Boba Pearl

**Purpose & Background**

**Purpose:** To create a nutrient dense soy based boba pearl to compete with nutrient void tapioca pearls.

**Background:** Bubble tea is a sweet tea with tapioca based pearls. This industry has experienced exponential growth and provides a market for nutrient rich substitutes.

**Market Analysis**

- 1,300 North American storefronts for bubble tea
- Target Demographic: Millennials ages 18-24
- Consumers expect bubble tea market on the rise since 2012
- Health conscious consumers are driving the market towards a alternative to tapioca pearls

**Impact & Sustainability**

- Encourage nutritious alternative to combat decline in national health
- Tapioca pearls made exclusively in Asia & inclusion of soy would bring market to North America

**Prototype Formulation**

15 iterations with various parameters.

**Prototype Viability**

Nutrition profile of soy pearl (left) vs. tapioca pearl (right).

Compression testing to mimic mouthfeel.

**Product Recipe**

A serving size of 50 grams per drink would supply 16 grams of protein, 19% of recommended fiber, and 20% of daily recommended potassium.

**Product Requirements**

1. Extruder System: able to cut dough but not as precise
2. Freeze Drying: preserving product through rapid freezing and then a vacuum to remove ice by sublimation
3. Pectin: structural agent but did not produce desired texture

**Process Flow Diagram**

**Process Scheduling**

**Prototype Formulation**

Nutrition profile of soy pearl (left) vs. tapioca pearl (right).

**Process Requirements**

- Amount
- Unit
- 175.525
- kWh/batch
- 24
- kg/batch
- 3 kg bags
- 121,271
- 2 kg bags
- 90-10
- kg/batch
- 0.025
- kg/batch
- 3.5 kg/batch
- 176.43
- kg/batch
- 7.6
- kg/batch

**Economic Analysis**

**Future Work**

Improve the mouthfeel of soy pearl to match that of the tapioca pearl

Increase amount of soy in product

Continuous improvement of process

Lower production costs

Market research on product

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