**Objectives:**

Our first objective was to develop a balanced breakfast food that is high in both protein and fiber to prolong satiety. The product was to be tasty, portable, and competitively priced. Following kitchen-scale product development, our second goal was to scale our process up to a manufacturing level capable of producing about 1.4 million kilograms annually.

**Market Analysis:**

- People eat breakfast 4.9 days/week
- 20% of people say they don't have time to sit down and eat breakfast
- Breakfast eaters: 50% eat for good nutrition
- Baked goods are most popular for ages 25-34
- Major nutritional concerns of consumers:
  - Fiber, Protein, Low cholesterol, Low fat, Low sugar, Low salt

**Product Design:**

Our original idea was to create a vegetable-based bread with a complementary filling. We experimented with flavor pairings. We chose a berry, granola based filling to further develop.

**Ingredients:**

**Blackberries, Whole wheat flour, Low-fat strawberry yogurt, Soy flour, All-purpose flour, Juice concentrate, Spinach, Strawberries, Oat flour, Zucchini, Wheat bran, Corn syrup, Salt and yeast.**

**Food Groups in Berry Complete**

- Grains
- Fruits
- Vegetables
- Dairy
- Other

<table>
<thead>
<tr>
<th>Nutrients (based on a 2000 kcal diet)</th>
<th>Target Range 15% of RDI</th>
<th>Current Product (125 g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories (kcal)</td>
<td>300</td>
<td>238.35</td>
</tr>
<tr>
<td>Fat (g)</td>
<td>9.75</td>
<td>3.68</td>
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<tr>
<td>Carbohydrates (g)</td>
<td>19.5</td>
<td>42.95</td>
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<tr>
<td>Fiber (g)</td>
<td>4.71</td>
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<tr>
<td>Protein (g)</td>
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<td>Vitamin A (IU)</td>
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<tr>
<td>Vitamin C (mg)</td>
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<td>14.63</td>
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<tr>
<td>Sodium (mg)</td>
<td>360</td>
<td>319.95</td>
</tr>
</tbody>
</table>

**Economic Summary**

- Total Capital Investment: $6,368,000
- Annual Operating Cost: $9,422,000/yr
- Annual Revenues: $15,790,000/yr
- Annual Production Rate: 1,420,000 kg/yr
- Return on Investment: 68.10%
- Payback Time: 1.47 yr

**SuperPro Designer Assumptions:**

- Simplified process
- Estimated total labor
- Advertising cost high variable
- Estimated failed product cost
- Equipment substitutions made due to equipment availability in SuperPro
- R&D costs not included

**Future work:**

- Research and Development
  - Develop product extensions for new flavors
  - Improve texture and mouthfeel
  - Tailor product to target audience acceptance through sensory tests
  - Substitute ingredients in order to comply with whole food market trends
  - Pilot plant trials
  - Shelf life and freezing studies
- Manufacturing Process:
  - Assess feasibility of current process scale up
  - Research proper equipment from suppliers
  - Product transport within facility
  - Include packaging equipment