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Objective

To meet the market's growing demand of good tasting fruit wine and fulfill consumer's requirement of having healthier wine option.

Background

Wine has a long history and is a common component in daily diet. With fruit wine getting popular around households and in market, blueberry wine is produced with advantages of high antioxidants and anthocyanin contents. From market analysis, a conclusion is obtained that wine has a growing market from 2011 to 2016 and is predicted to be continuously growing till 2021.

Impact

- Positive impact:
- Providing innovative wine with high nutrition contents.
 - Stimulation of local blueberry economy and providing more jobs opportunity
- Potential negative impact:
- Industrial pollution (air pollution, water pollution, etc.)

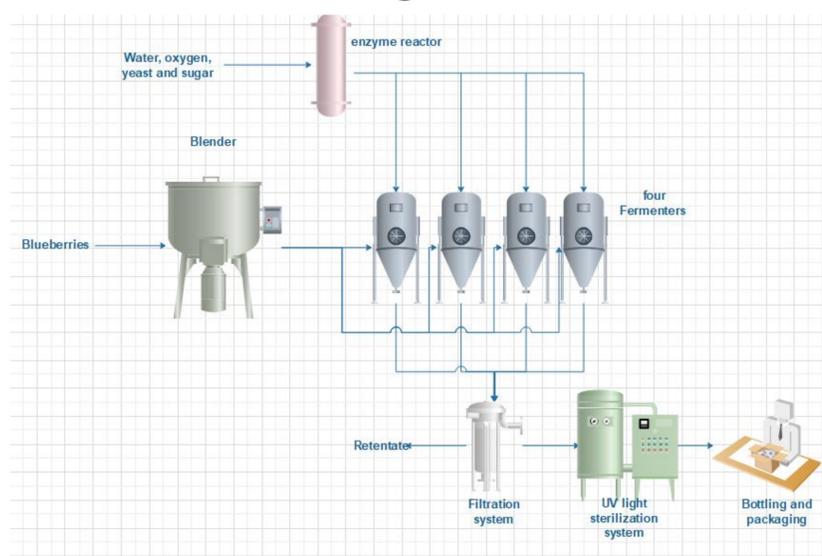
Unit Operations

Unit operation	Optimization Variable	Parameter Being Evaluated
Crushing	Radius	Desired viscosity
Fermentation	Number of tank	Gross Profit
Filtration	/	/
Packaging	/	/

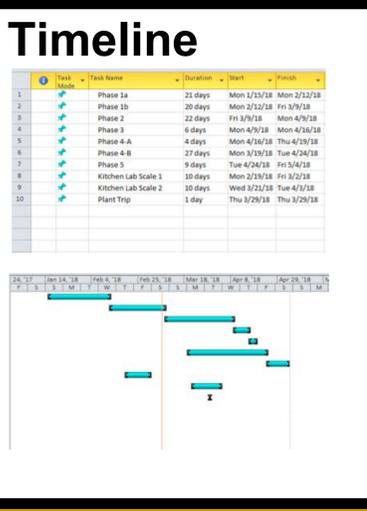
Budget Information

Cost	Price
Total Capital Investment	289,743.90
Annual Manufacturing Cost	883,134.74
Annual General Expenses	75,691.81
Annual Production Cost	958,826.55

Process Flow Diagram

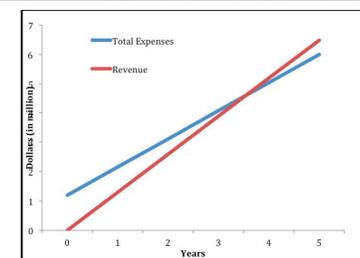


Frozen blueberries were first crushed using a food blender. Together with the yeast, the blueberry puree and juice were fermented in a glass jar. The final product was taken out and clarified filtration paper and collected in small glass container.

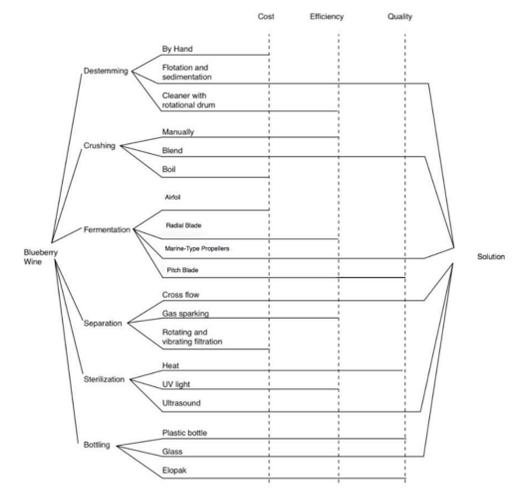


Economics Analysis

Year	Outflow	Inflow	Net Cash Flow	Profit
0	1,199,846.70	0	-1,199,846.70	-1,199,846.70
1	958,826.55	1,296,000	337,173.45	-862,673.25
2	958,826.55	1,296,000	337,173.45	-525,499.80
3	958,826.55	1,296,000	337,173.45	-188,326.35
4	958,826.55	1,296,000	337,173.45	148,847.10
5	958,826.55	1,296,000	337,173.45	486,020.55
6	958,826.55	1,296,000	337,173.45	823,194.00
7	958,826.55	1,296,000	337,173.45	1,160,367.45
8	958,826.55	1,296,000	337,173.45	1,497,540.90



Evaluation of alternatives



Product Composition

Serving Size 1 bottle (17 fl oz)

Ingredients	
blueberries(frozen)	89.6%
Sugar(Glucose, fructose)	10.4%
Yeast	
S. cerevisiae	0.003g
ABV	12.5%

Constraints

To produce high quality blueberry wine, large continuous crop of high quality blueberries is required. The production is designed to use clean frozen blueberries. Therefore to minimize the transportation cost for raw material, it is better to build the plant close to blueberry farms.

Recommendations

- Add different amount of sugar or change the fermenting time to improve taste
- Use more environmental friendly materials and avoid using plastic for bottling blueberry wine

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