



Biodegradable Soy Foam Food Container

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Objective

- Innovation of biodegradable soy foam food containers
- Detailed analysis of Zero-Discharge Process
- Complete economic and market analysis of the product
- Development of the process



Introduction

For our project, we decided to base the goal in conjunction with Student Soybean Product Innovation Competition. We used Soybean to derive biodegradable soy foam food container which are not only environmental friendly as well has health benefits.

Procedure

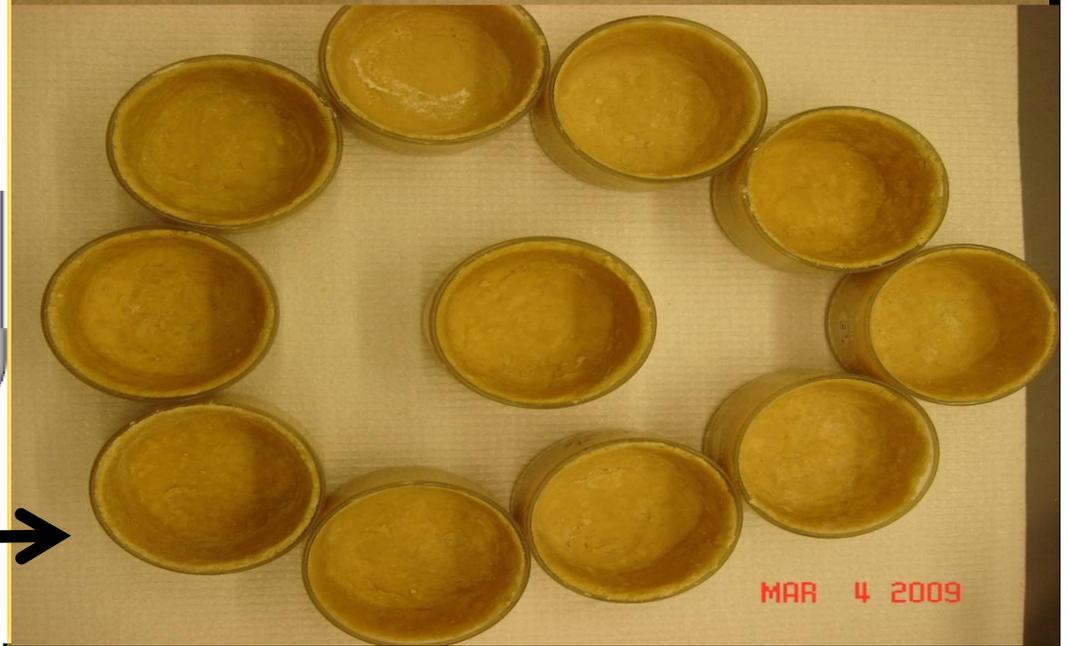
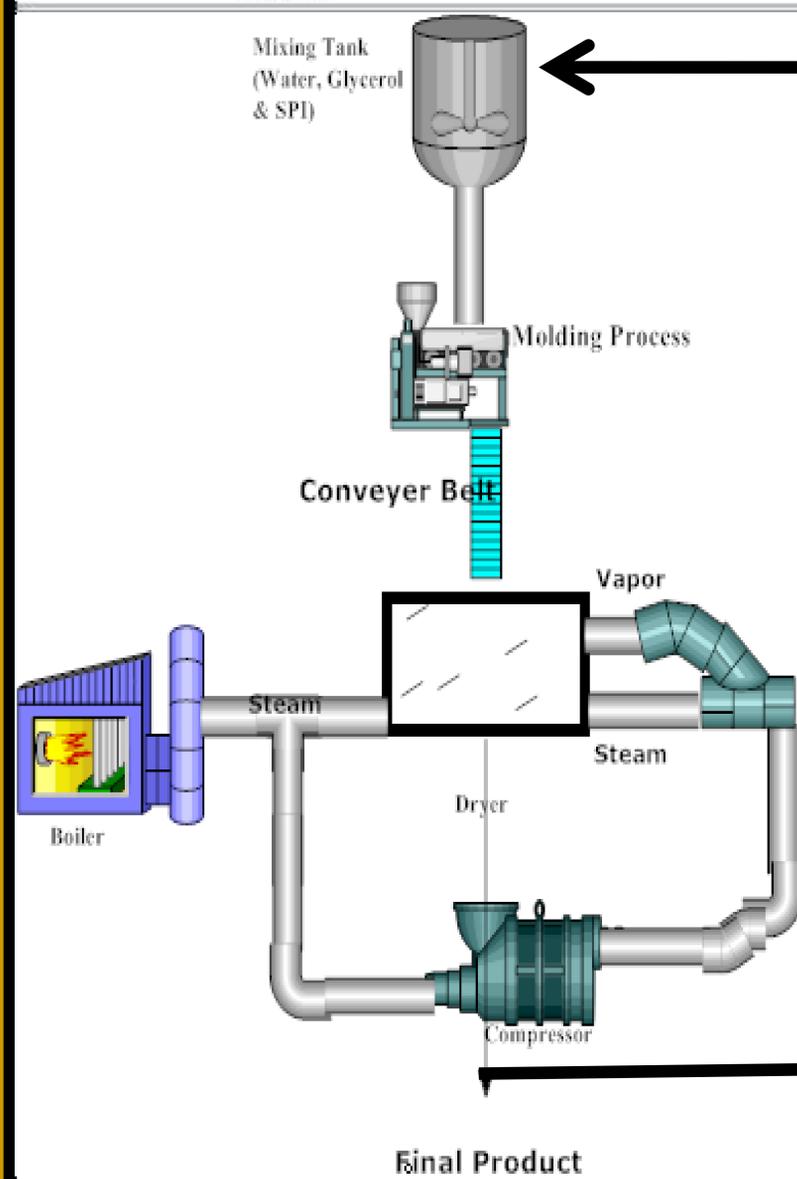
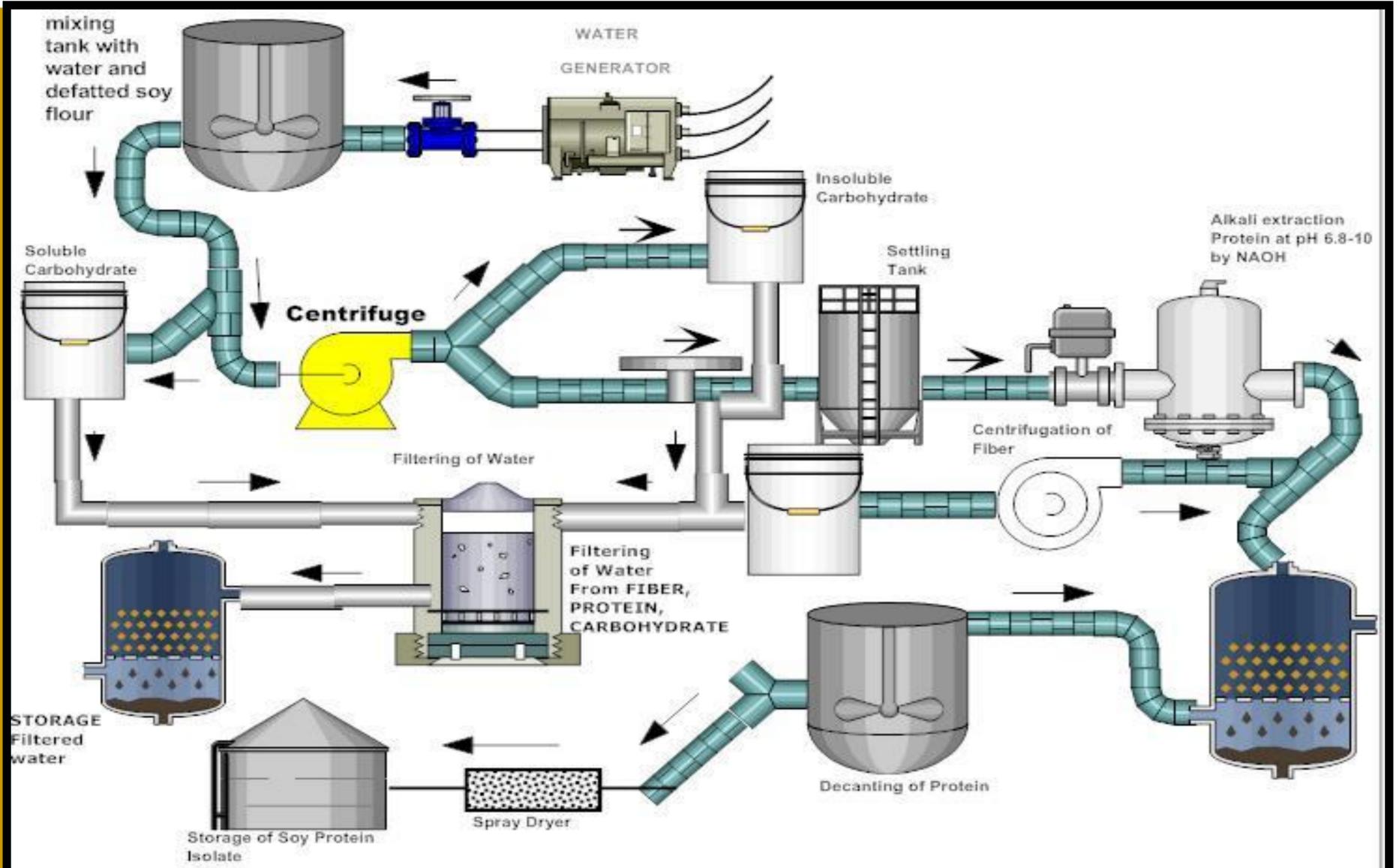


1. Mix water, glycerol, baking powder and soy protein isolate together
2. Form a dough mixture
3. Use a mold to form the desired food container
4. Use a conventional oven to dry the container
5. Melt paraffin wax and apply it to the food container

Ingredients	Measurements
Soy Protein Isolate (SPI)	25 grams
Baking Powder (Double Acting)	2.5 grams
Glycerol/Glycerin	19 ml
Distilled Water	19 ml
Controls	Measurements
Temperature (Baking temperature)	90 degrees Celsius
Time (Baking time)	6 hours



Process Layout – Zero Discharge



Ingredients	Cost	Quantity	Cost per quantity
Soy Protein Isolate	\$0.002/g	25 grams	\$0.05
Glycerol	\$0.0023/ml	19 ml	\$0.0437
Baking Powder	\$0.007/g	2.5 grams	\$0.0175
Water	$\$1.66 \times 10^{-6}/\text{ml}$	17 ml	$\$2.8 \times 10^{-5}$
Electricity	\$0.1065/kW-hr	6 hour	\$0.639
Total			\$0.75



Advantages and Benefits of Soyfoam

- Contains edible ingredients therefore reduces waste for society
- Bio-degradable and environmental friendly
- Will help economic condition of petroleum as petroleum product is used to the Styrofoam
- The new use of soybean to make food containers can benefit the market of soybean and can create a market of high demand and profit

Benefits over Styrofoam

Styrofoam causes following health problem, which Soy cups will not cause as it contain all food grade ingredients.

- Low platelet counts and hemoglobin
- Lymphatic abnormalities
- Neurotoxic effects caused in the brain, spinal cord and nerves as the styrene accumulates in your system.
- Can cause fatigue, nervousness, sleep trouble and other acute and chronic health problems related with nervous system
- Carcinogenic

Acknowledgment

First we would like to thank Dr. Ganesan Narsimhan for his support and advice as our advisor. We would also like to thank Jennifer Nordland- Program Manager and Katharine Woodhead- Program Coordinator for their continuous guidelines and support to continue with the competition. We extend our special gratitude to Dr. Martin Okos for his inputs and ideas on how to approach a research problem.

A special thanks go to the SoyBean board and Purdue University for giving us this platform to utilize our skills and knowledge to create a new product that can make a difference to the future generations to come.

Last but not least we thank our family and friends for their unconditional support, love and encouragement to pursue an interest in life and achieve our goals with hard work and determination.