Low-cost, locally fortified porridge flour for improved maternal health in Kenya

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PROJECT BACKGROUND

Despite this century’s advancements in maternal and infant care, women and children around the globe continue to suffer from poor health as a result of acute maternal malnutrition (USAID, 2018). For many women, particularly those living in developing countries, limited access to nutritious foods is a disadvantage caused by gender discrimination, lack of financial resources, and limited transportation (U.N. Women, n.d.). These hindrances lead to a depressed intake of essential vitamins and minerals, particularly those critical for infant development such as vitamin A, folate, and iron (U.N. Women, n.d.). As a result, children are frequently born with severe micronutrient deficiencies that hinder both physiological and psychological development (Attanasio et al., 2018).

Current trends in global development, food science, and processing point towards the creation of supplemented and fortified food products as a way to address this issue (USAID, 2018). This project aims to address the need of improved maternal health in Kenya through the production of a low-cost, locally fortified porridge flour.

GLOBAL & SOCIETAL IMPACT

Addressing maternal malnutrition to ensure a more food secure planet and a healthier future generations, including Goals 1, 2, 3, and 5 of the UN Sustainable Development Goals.

OBJECTIVES

Create a porridge flour product that is:
- Low-resource (water, energy) and poor infrastructure
- Majority of women in Kenya do not have access to traditional grocery stores/supermarkets
- Need for low-cost and high nutrient
  - Local ingredients: sweet potato, soybean, millet
  - Water recycle system

PROCESS FLOW

![Figure 1: Micronutrient deficiencies in Kenya for women and children <5. Source: Kenya National Nutrition Action Plan](image)

1 serving per day

![Figure 2: Percentage of mass lost during drying of sweet potatoes at 90 °C for 90 minutes in an oven. Trays exhibited a higher amount of mass lost during the drying period than those of sliced samples.](image)

ECONOMIC ANALYSIS

Annual Total Product Cost: $75,099.71
Annual Gross Income: $161,400
Annual Cash Flow: $40,216.99
Sales Price: $2.00 / kg
Annual Internal Rate of Return: 19.8%

![Economic Analysis Table](table)

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REFERENCES


Jan-April 2019
- Updated process flow, optimization, and controls
- Economic analysis and business plan
- Final project delivery

Future Work
- We have found that this work has potential applicability with a community partner, Ingabeyacu Enterprise LLC, in Rwanda.