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Company Background

The Food Product Development Lab is a research and development center based on the Montana State University campus in Bozeman, MT. The Lab has worked with Indigenous and local communities to co-develop food products that are nutritious and eco-friendly while preserving the traditions of their collaborating partners.

Production facilities are owned and operated by Indigenous and local communities in MT and

Senegal. Research facilities include Hannon Hall (8334 sf) and Harrison Hall (758 sf) on the MSU campus in Bozeman, MT, and host 16+ researchers and staff. A manufacturing plant is planned for construction in Ndangane, Senegal, for use by the collaborating community (1900+ sf), and the Kaolack chamber of commerce will also host production.



“It was exciting to learn about the many facets that go into innovating, testing, and scaling up production of a sustainable food product. This experience strengthened my communication, management, and presentation skills, and has provided me with valuable experience moving forward with my career.” ~HK

Project Background

With 75% of the populace in Senegal struggling with chronic poverty, and 71% of children 6-59 months of age facing anemia and other forms of malnourishment, a group of women farmers in the Kaffrine region of Senegal desired a way to improve their economy and provide nutritious food for their children. This desire spurred the creation of BonBon Bouye – a peanut nutrition bar made from the indigenous peanut and baobab crops – alongside the FPDL and prompted research into a nutritionally enhanced fermented beverage made using Indigenous ingredients and methods. Fermentation has been shown to increase the bioavailability of key micronutrients such as iron as well as antioxidative properties, and thus this production method was chosen for the purpose of meeting the needs of the women farmers.

The FPDL has been developing a fermented beverage using the Indigenous plants baobab and sorghum alongside the community but has faced issues regarding a short product shelf-life. The collaborating community does not currently have access to a refrigerator to keep the product stable for longer than 5 days. Furthermore, the consumer market also lacks access to refrigeration.



Incentives To Change

Dedicated to innovating food products healthy for both people and the planet, the FPDL is committed to co-creating a method with their collaborating community to produce and store the fermented beverage. This project will focus on extending the shelf-life of the beverage and will also address issues of sourcing sustainable and affordable packaging materials.

SOLUTIONS

Drying the Beverage

By oven-drying the product, the FPDL can create an instant beverage powder with a longer shelf-life. This would save \$1,298.07 from the need to buy a 86.81 cuf refrigerator, \$359.47 annually from

operating the refrigerator, and also benefit the consumer by increasing their ability to store the product. The community is currently working to source electricity.

Sourcing Packaging from the CoC

By sourcing the packaging from the Chamber of Commerce in Kaolack, the collaborating community will save \$0.24/bag not including shipping compared to importing the same packaging.

Choosing Recyclable/Reusable Packaging

By choosing a Kraft paper bag, the packaging will have the opportunity to be recycled and thus decrease environmental footprint. Environmental savings are under quantification. Ideally reusable packaging would be used, but current lack of consumer education and interest limits potential.

Recommended P2 Actions	If Implemented:								If Not Implemented:	
	\$		Annual Reductions							
	One-time Cost to Implement (\$)	Annual Savings from P2 Action (\$)	Hazardous Material input (lbs)	Hazardous waste (lbs)	Air emissions (lbs)	Water pollution (lbs)	MTCO _{2e} emissions (tons)	Water use (gal.)	Barrier to Implement	Plans to Implement within 5 years? (pick Y/N)
Drying the beverage	-	359.47	-	-	-	-	-	-	Available electricity	Y
Packaging from CoC	-	0.24/bag	-	-	-	-	-	-	Initialize production	Y
Reusable packaging	-	-	-	NA	-	-	-	-	Consumer interest	N