

"Cottonseed Meal: A Sustainable Source for Surfactant Innovations"

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Objective of Innovation

Enzymatic synthesis



**Biodegradable
&
sustainable approach**



HYDROPHILIC

Attract water.

HYDROPHOBIC

Repel water and collect impurities

Surfactants Applications



Personal Care



Household Care



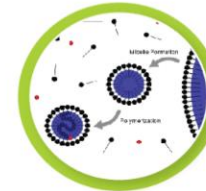
Pharmaceuticals



Textile Auxiliaries



Institutional Cleaning



Emulsion Polymerization



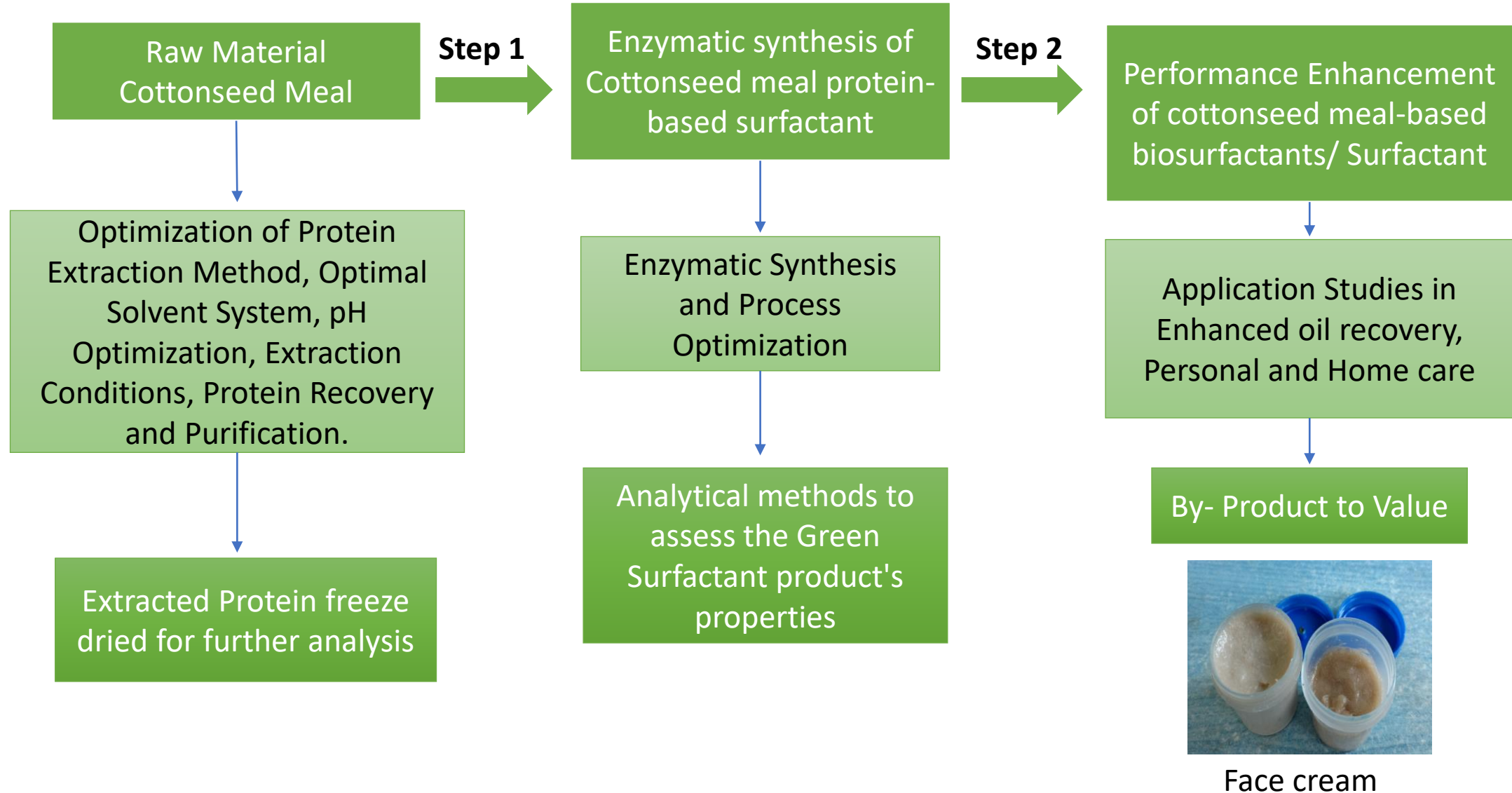
Agriculture



Oil & Gas

Green surfactant

Description of Innovation



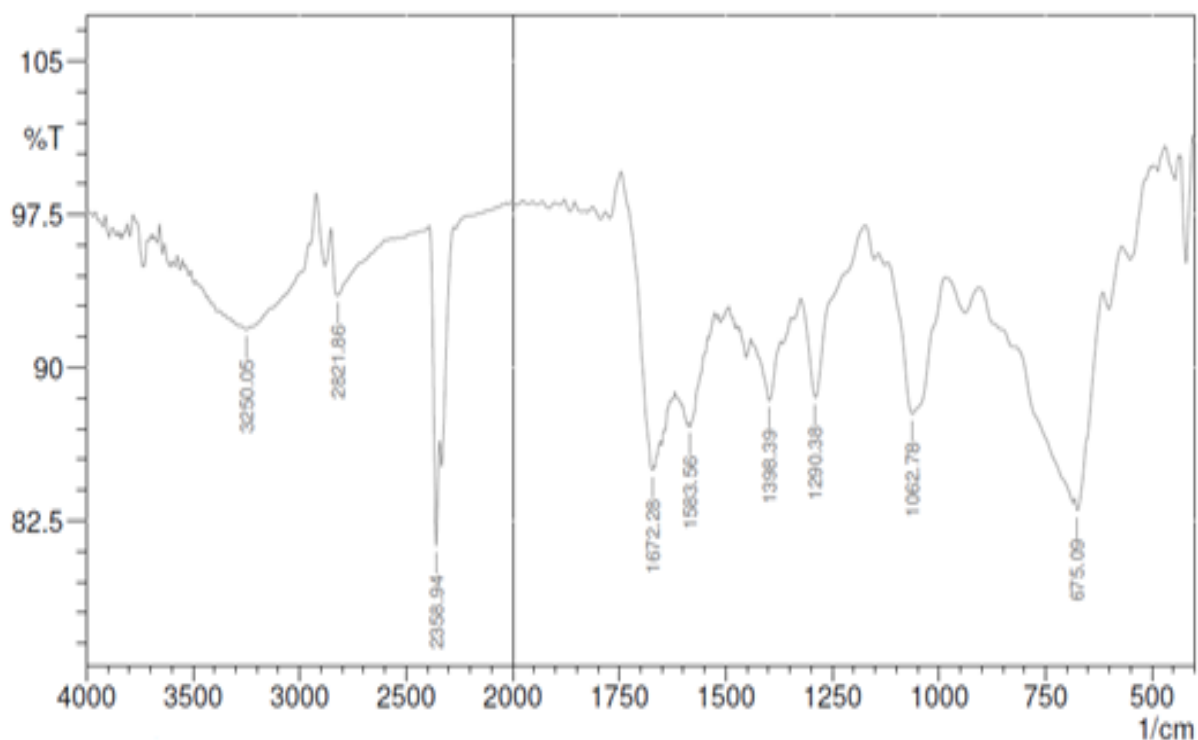
Food Industry By-Product	Percent Protein content Kjeldahl Method	Antioxidants
Cottonseed Meal	39% (arginine,aspartic,glutamic,isoleucine ,phenylalanine,leucine,lysine,serineglycine etc.)	Gossypol(0.02-6.64%)



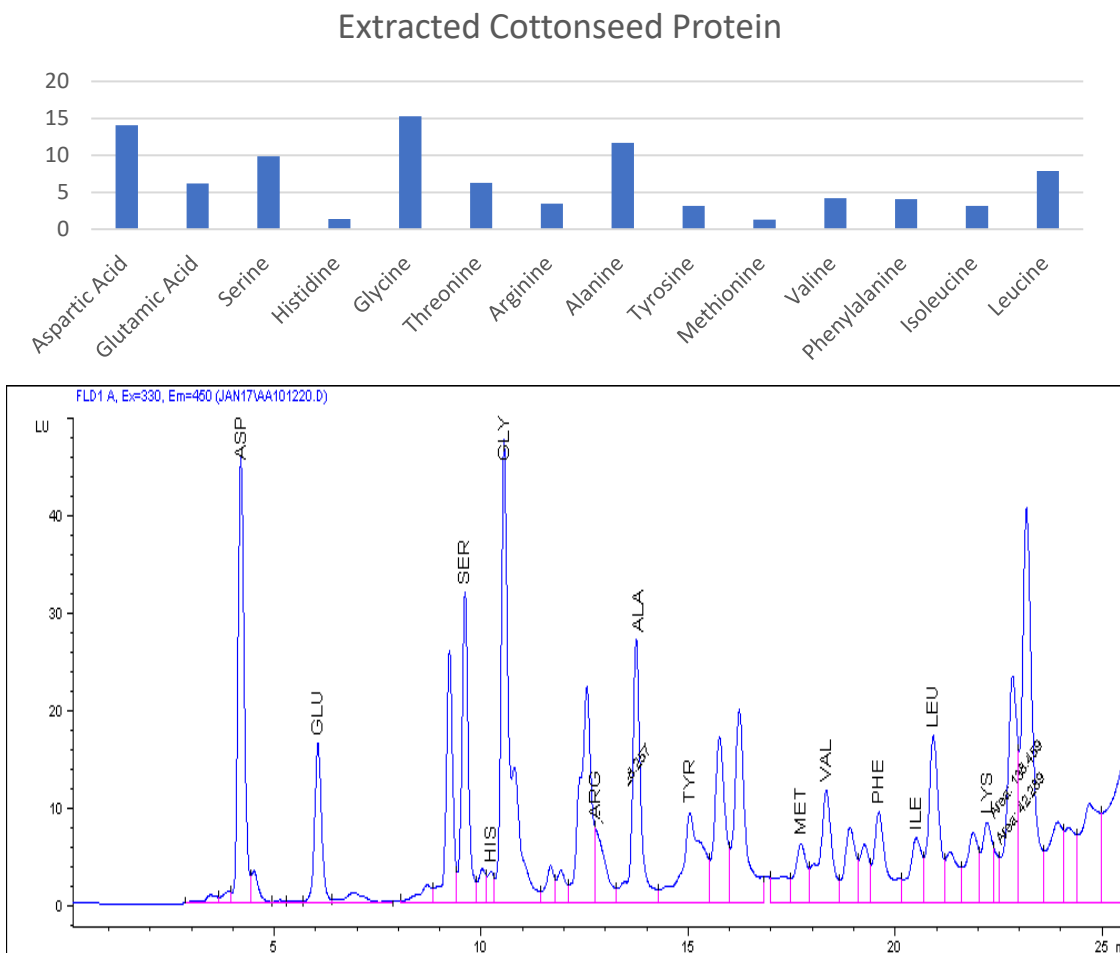
Acid- Alkali extraction Optimization studies



Isolated cottonseed protein for freeze drying



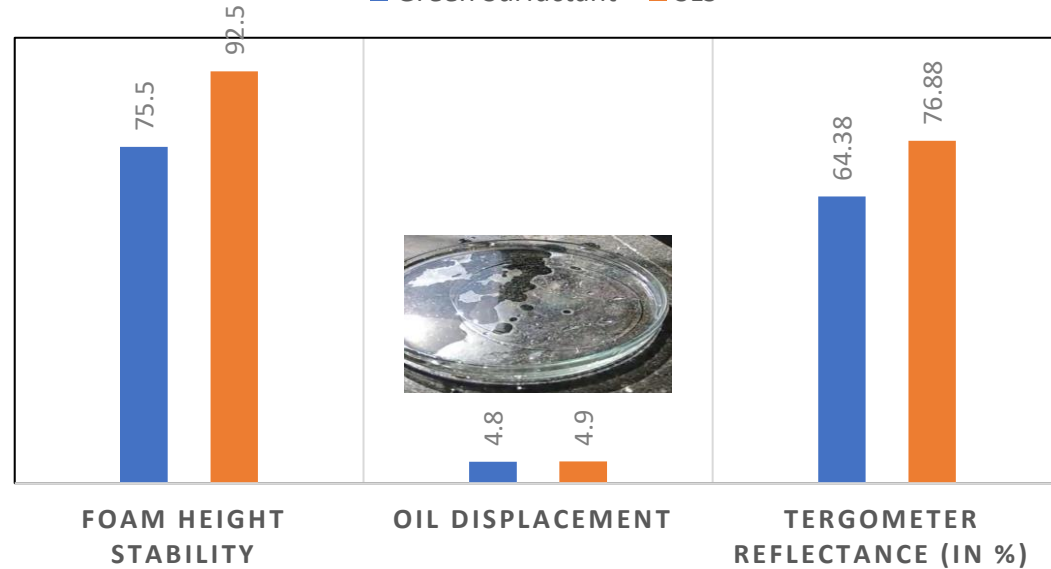
FTIR Graph of Green Surfactant confirms presence of the Amido group: NH stretch was observed in the range of 3070 - 3350 cm^{-1} , C=O stretch in the range of 1590 - 1750 cm^{-1} and NH bending was observed in the range of 1650 cm^{-1}



HPLC Analysis of Free Amino Acid Level in nmoles/ml of Extracted protein with yield of 50-60% from cottonseed meal

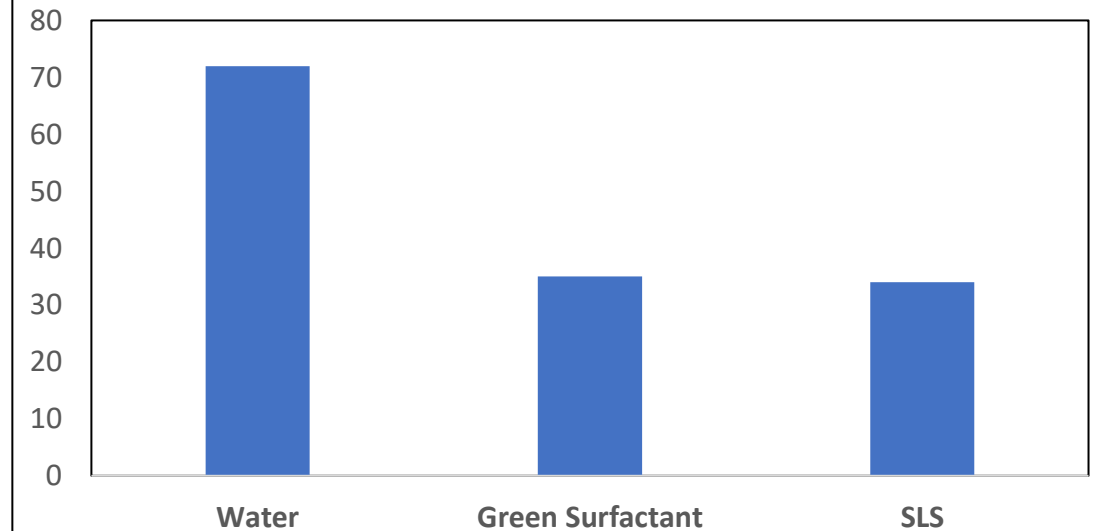
COTTONSEED MEAL BASED SURFACTANT VS SLS

■ Green Surfactant ■ SLS



Surfactant Properties shows the synthesized green surfactant with commercial SLS is comparable

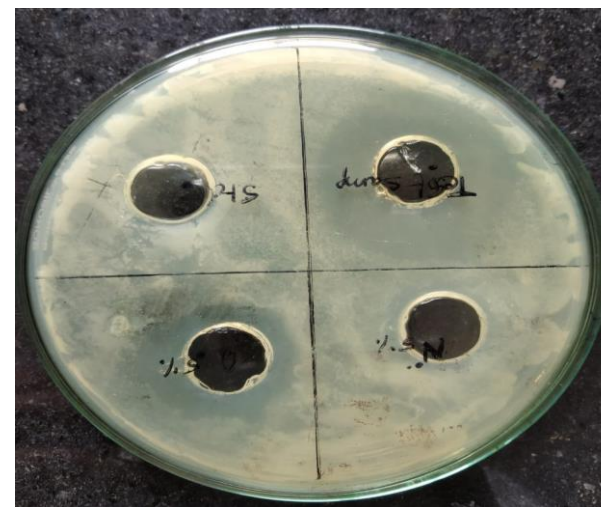
COTTONSEED MEAL BASED SURFACTANT VS SLS



Surface tension (mN/m) of synthesized green surfactant with commercial SLS



Day 5th 98% oil recovery, Valuable application in Enhanced oil recovery



Sample	Anti microbial study Zone of inhibition (mm)
Green surfactant	20 mm
Green shampoo	32 mm

Market potential of Innovation

- ✓ There is a global shift towards sustainability and increased consumer awareness regarding the environmental impact of products.
- ✓ Target audiences are Environmental organizations, regulatory bodies and Companies involved in the those seeking sustainable and environmentally friendly alternatives.
- ✓ The agricultural industry, including farmers and agricultural supply companies, can be a target audience for applications of cottonseed meal surfactants in agriculture
- ✓ Circular Economy and Waste Utilization of the use of cottonseed meal, a byproduct of the cotton industry, promotes circular economy principles by transforming waste into a valuable resource
- ✓ This Innovative work is a step in pollution prevention and sustainable practices.

Research Papers Related to Cottonseed meal value added products

- 🕒 Nikita Wanjari, Jyotsna Waghmare: A review on latest trends in cosmetics –cosmeceuticals, International journal of pharma research and review, M2015: (4):45-51.
- 🕒 Nikita Wanjari, Jyotsna Waghmare: Phenolic and antioxidant potential of sunflower meal, Advances in applied science Research, 2015, 6(4):221-229.
- 🕒 Nikita Wanjari, Jyotsna Waghmare: Extraction of antioxidant from deoiled sunflower cake, Journal of lipid science and technology, 2015, 47(1):14-17.
- 🕒 Nikita Wanjari, Jyotsna Waghmare. Extraction and Purification of Sunflower Meal Extract for Development of Cosmeceutical Antioxidant Skincare Cream. Inventi Impact. Cosmeceuticals, 2020(1):9-14, 2020
- 🕒 Ongoing work on three research papers.....

THANKING YOU