

# Protein Reinvention: Revolutionizing the Cottonseed Protein Industry with Ultra Low Gossypol Protein

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ISO 9001:2015



# CIRCOT

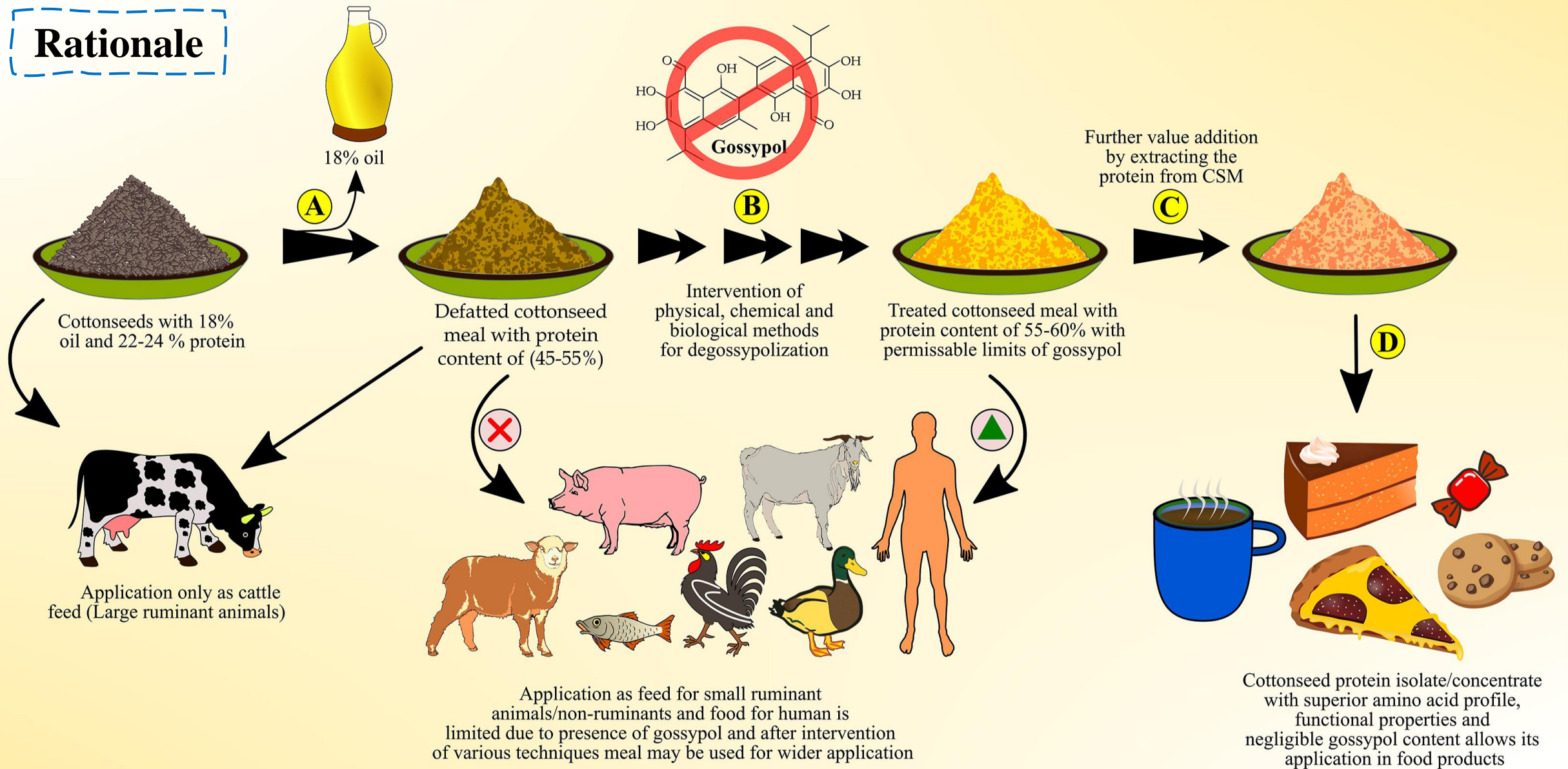


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# What is the issue?

## Rationale





ISO 9001:2015

# Description of Innovation



- To resolve the issue, **optimization of the extraction** of cottonseed protein isolate (CSPI) from defatted cottonseed meal (CSM) using **Box Behnken design was done using chemical method (Alkali + Combination of salts)**
- Optimal conditions for the recovery of protein: alkali: sample ratio (33:1), NaCl (0.15 mol/L), Na<sub>2</sub>SO<sub>3</sub> (0.27%) and time (147.5 min) at pH 11 with predicted value of 93.6% protein recovery.
- Wet-lab confirmed that experimental yield of CSPI was 88.5% with less than 450 ppm of free gossypol concentration.



# Features of your innovation



- Isolated protein contains **ultra-low gossypol concentration (ULGC,  $<0.1 \mu\text{g}/\text{mg}$  or 100 ppm)** which is under the allowable limits of 600 ppm as per United Nations Food and Agriculture Organization and World Health Organization for application in foods.
- Isolated protein from cottonseed showed good colour property along with neutral taste and aroma.







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## Extraction of ultra-low gossypol protein from cottonseed: Characterization based on antioxidant activity, structural morphology and functional group analysis



TOXIN REVIEWS

<https://doi.org/10.1080/15569543.2021.1889605>



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RESEARCH ARTICLE



## Evaluation of detoxified cottonseed protein isolate for application as food supplement

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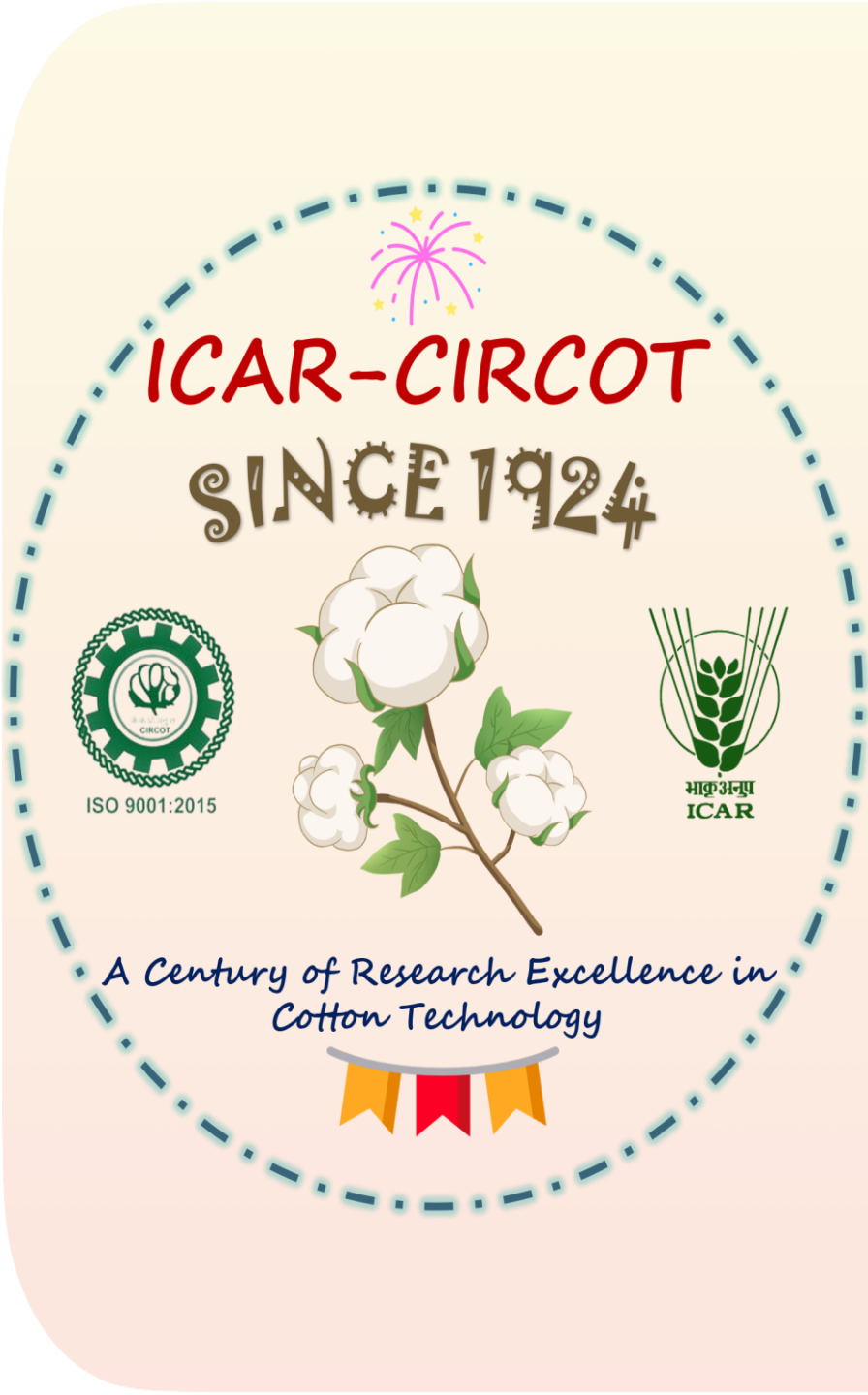
Trends in Food Science & Technology

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Cottonseed: A sustainable contributor to global protein requirements









**Ninth Asian Cotton Research  
and Development Network (ACRDN) Meeting  
& International Conference**

Date & Venue :  
**December 06-08, 2023**  
**ICAR-CIRCOT, Mumbai, Maharashtra, INDIA**

***"INNOVATIONS FOR A RESILIENT AND SUSTAINABLE COTTON  
PRODUCTION AND VIABLE VALUE CHAIN"***

Thank you