Review Form 3

Journal Name:	**Journal of Advances in Biology & Biotechnology**
Manuscript Number:	**Ms_JABB_129167**
Title of the Manuscript:	**Arresting Rancidity in Pearl Millet Flour through Halogen Air Frier Treatment**
Type of the Article	

PART 1: Comments

	Reviewer's comment	**Author's Feedback** *(Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)*
Please write a few sentences regarding the importance of this manuscript for the scientific community. A minimum of 3-4 sentences may be required for this part.		
Is the title of the article suitable? (If not please suggest an alternative title)		
Is the abstract of the article comprehensive? Do you suggest the addition (or deletion) of some points in this section? Please write your suggestions here.		
Is the manuscript scientifically, correct? Please write here.		
Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.		

Review Form 3

Is the language/English quality of the article suitable for scholarly communications?		
Optional/General comments	**Comments** The study aims to address rancidity in pearl millet flour caused by lipid oxidation and enzymatic activity of lipase and lipoxygenase. Provides a scalable and effective solution using halogen air frying to extend shelf life and improve flour quality. **Key Findings**: 1. **Lipase**: ▪ Initial activity: 475 mM/min/mg protein (control). ▪ Reduced to 16.44 mM/min/mg protein at 150°C for 4 minutes. ▪ Significant reductions across all temperatures and durations, confirming heat-induced enzyme denaturation. **ASSAY (suggestions)** • While Tween 20 acts as an emulsifier to stabilize the olive oil-water mixture, its presence may interfere with enzyme activity. The assay should include controls to account for any potential effects of Tween 20 on the enzyme's performance. {Tween 80 or Triton X-100 may give more specific results} • Heating the mixture at 90 °C for 5 minutes could potentially denature other proteins or interfere with secondary reactions. It's important to validate that this step does not affect the specific reaction being measured. **2. Lipoxygenase (LOX)** ▪ Initial activity: 0.81 nM HPOD/min/mg protein (control). ▪ Complete inactivation at 140°C and 150°C for 4 minutes. ▪ Rapid inactivation demonstrates LOX's sensitivity to heat, crucial for oxidative stability. **Assay(suggestions)** • Monitoring absorbance for only 2 minutes might not capture the full extent of the enzymatic reaction, especially if LOX activity varies with substrate availability or enzyme stability. • The method assumes that the molar extinction coefficient (25 mM^{-1} cm^{-1}) is accurate under the given experimental conditions. Variations in the coefficient due to buffer composition or pH could affect the calculated enzyme activity. 3. **Colorimetric Data**:Increasing redness and yellowness suggest additional benefits for products where visual appeal is critical, though these changes may impact perceived freshness. Improvement for figs; • Error bars should be added to reflect data variability. • Inclusion of a trendline or annotation to emphasize the near-complete	

	inactivation at higher temperatures and longer durations. **Limitations:** • The method does not mention the inclusion of negative controls (e.g., reactions without enzyme extract or substrate) to account for non-enzymatic reactions or baseline absorbance changes. • Potential nutritional losses and sensory characteristics of flour due to high-temperature treatment are not considered. • The impact of halogen air fryer treatment on other nutritional components (e.g., protein, fibre and mineral content). • Halogen Air Fryer equipment diagram must be inserted in manuscript. • potential commercial applications and scalability of the halogen air fryer technology in rural setups. • Highlight correlations between temperature, enzyme activity, and color parameters in graphical formats. • Compare halogen air frying with alternative methods like microwave or hydrothermal treatment for cost-effectiveness and scalability. **Conclusion:** This study effectively demonstrates that halogen air frying significantly reduces rancidity-causing enzyme activity while minimally altering visual properties. By extending the shelf life and enhancing sensory attributes, this method holds potential for broader utilization of pearl millet in food systems. With additional focus on consumer acceptance and nutritional impacts, halogen air frying can become a benchmark technology for improving the usability of climate-resilient grains. **Future Research**: Could explore enhancement of the usability of a climate-resilient grain, contributing to food security in arid and semi-arid regions.	

PART 2:

	Reviewer's comment	**Author's comment** ***(if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)***
Are there ethical issues in this manuscript?	***(If yes, Kindly please write down the ethical issues here in details)***	

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