Foods 2024 Conference
The 5th International Electronic Conference on Foods
28–30 October 2024 | Online
MDPI

Effect of various processing techniques on nutritional, techno-functional, structural, and molecular interactions of finger millet (*Eleusine coracana*)

•P.S.R.Fonseka1*, K.D.P.P.Gunathilake1
•1Department of Food Science and Technology, Faculty of Livestock, Fisheries & Nutrition
•Wayamba University of Sri Lanka.

INTRODUCTION

- **Finger millet is a nutraceutical crop and a "super cereal" (Sathiyabama & Manikandan, 2021)**
- **Good source of dietary fiber and minerals (Sharma et al. 2022).**
- **The Impact of different processing techniques was assessed.**
- **Several processing techniques are used to improve the nutritional attributes.**
- **Additional knowledge of the functionality of finger millet will increase utilization and potential in the food industry and contribute to better food security.**

OBJECTIVES

General objective

To evaluate the impact of different processing techniques on biological, functional, structural, and molecular characteristics of the Sri Lankan recommended variety of finger millet**.**

METHOD

Sample preparation

T0	T1	T2	T3	T4
Control sample (U-FMF)	**Soaking (S-FMF)**	**Germination (G-MF)**	**Fermentation (F-FMF)**	**Combination (SGF – FMF)**

Experiments

Anti-nutritional factors

1. Tannin
2. Phytate
3. Saponin

***In vitro* nutrient digestibility**

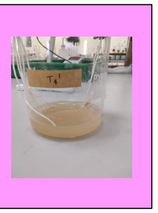
1. *In vitro* starch digestibility
2. *In vitro* protein digestibility
3. Bio- accessibility and availability

Techno–functional properties

1. Water absorption capacity – WAC
2. Water solubility index – WSI
3. Oil absorption capacity – OAC
4. Paste clarity – PC
5. Swelling power – SP
6. Emulsion activity – EA
7. Emulsion stability – ES
8. Viscosity

Structural and Molecular Interactions

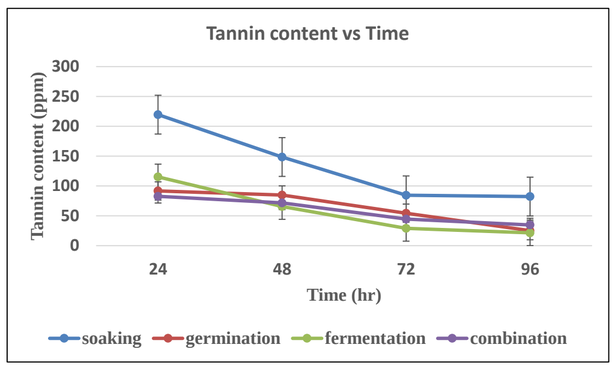
1. SEM
2. FTIR

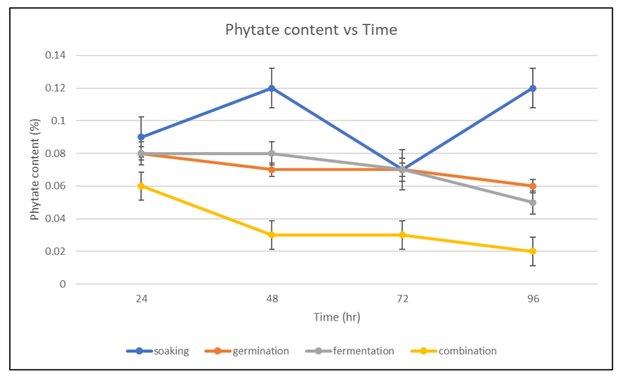


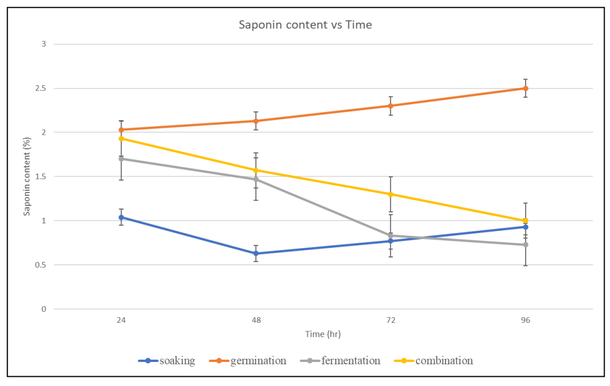
Statistical analysis

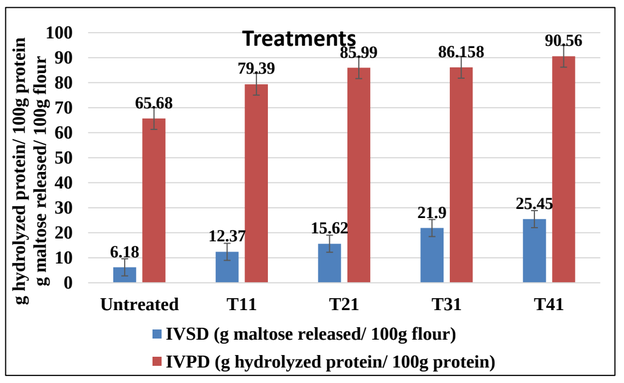
One-way Analysis of Variance (ANOVA) at a 5% level of significance was used for the statistical analysis.
SPSS software was used to evaluate all the data that was collected throughout the research.

RESULTS & DISCUSSION

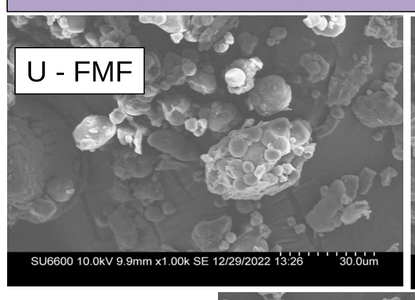


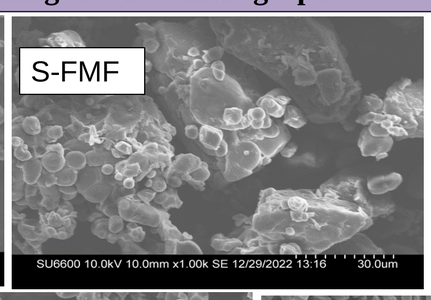


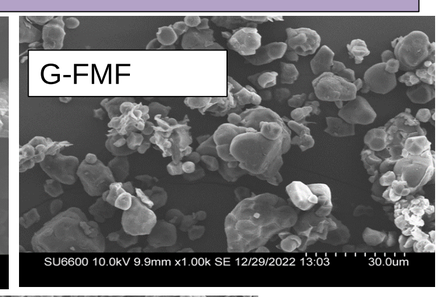


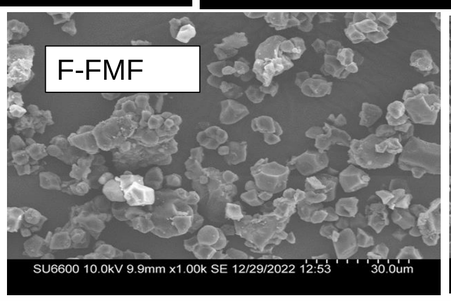


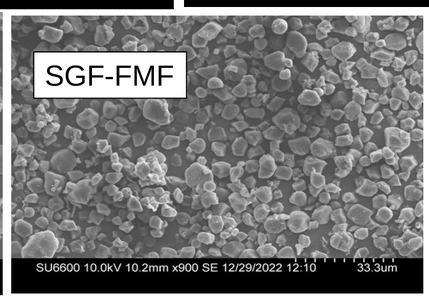
Structural interactions - Scanning electron micrographs



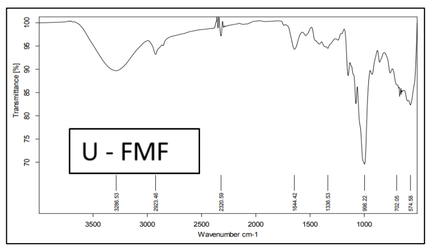


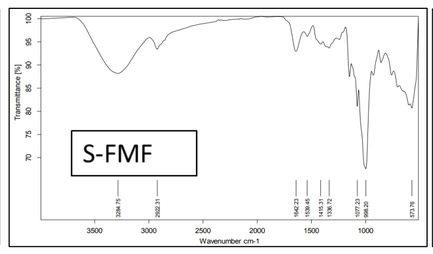


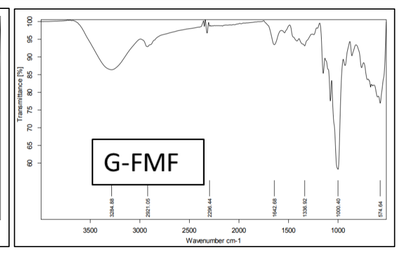


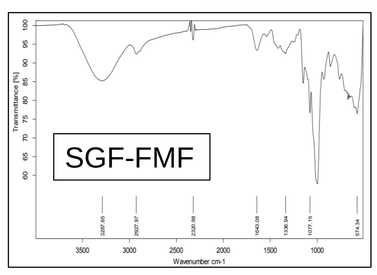


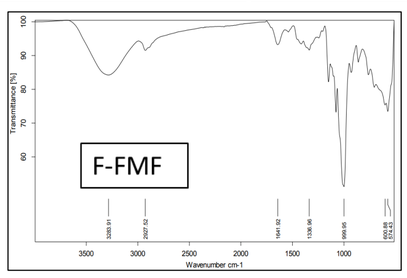
Molecular interactions – ATR-FTIR spectra











CONCLUSION

- All processing techniques significantly **reduced tannin content** and **phytate content** but the **saponin content of germinated flour increased.**
- All processed techniques **increased *in vitro* starch and *in vitro* protein digestibility.**
- The **combination of soaking, germination and fermentation greatly improved** most of the functional properties of flour with reduced antinutrients.

REFERENCES

Sharma, R. and Sharma, S., 2022. Anti-nutrient & bioactive profile, in vitro nutrient digestibility, techno-functionality, molecular and structural interactions of foxtail millet (Setaria italica L.) as influenced by biological processing techniques. Food Chemistry, 368, p.130815.