# The 5th International Electronic Conference on Foods



28-30 October 2024 | Online

## Thermal stability of blending soybean oil with coconut oil during continuous deep-frying of banana chips

Sopheaktra Yi<sup>2</sup>, Sela Kong<sup>1,2,3\*</sup>, Manit Say<sup>2</sup>, Reasmey Tan<sup>1,2</sup>

<sup>1</sup> Research and Innovation Center, Institute of Technology of Cambodia, Russian Federation Blvd., P.O. Box 86, Phnom Penh, Cambodia <sup>2</sup> Faculty of Chemical and Food Engineering, Institute of Technology of Cambodia, Russian Federation Blvd., P.O. Box 86, Phnom Penh, Cambodia <sup>3</sup> Department of Research, University of Puthisastra, Phnom Penh 12211, Cambodia

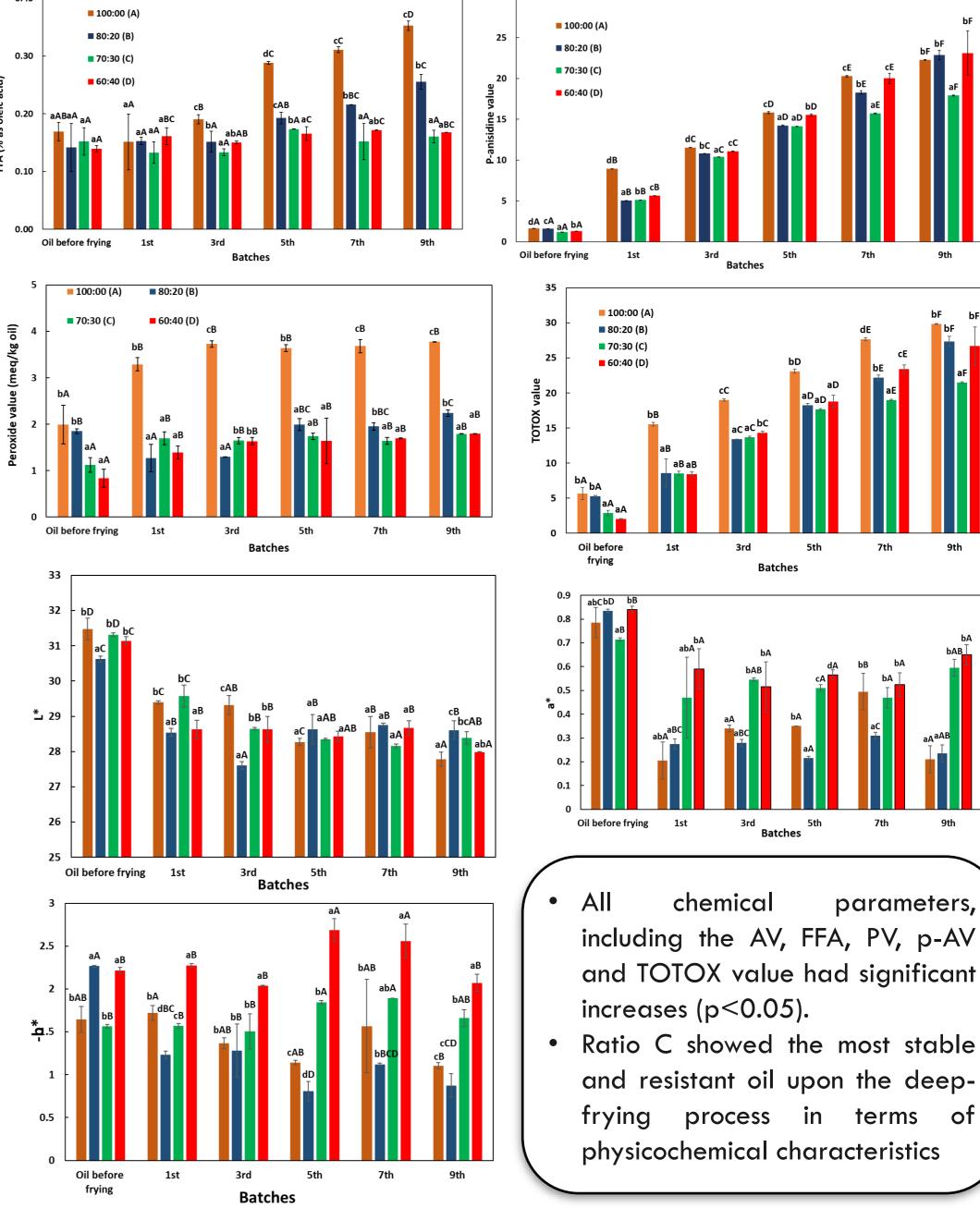
#### INTRODUCTION Deep-frying process (DFP) Low stability Coconut oil Soybean oil to oxidation Highly saturated (about Oil blending Oil used 90%-92%) coconut oil **Enhancing** Natural antioxidant thermal Higher thermal stability than stability palm oil and sunflower oil 160-180°C Instability of soybean oil used in DFP Aim: This research investigated the thermal stability of different blending Chemical oxidation Health risks ratios of soybean oil with coconut oil Oxidation continuous the deep-frying Elevated blood pressure during **Hydrolysis** their effects and Cardiovascular disease process Polymerization **Deteriorated** High viscosity physicochemical properties. Cancers, etc. oil Darkening

### **METHODS** 2. Blending oils 1. Preparing banana Soaking in citric acid Slicing Dehulling Stirring SB CO (5 min, 60 °C Ratios (% v/v) Soybean oil (SB): Coconut oil (CO) ■ 100:00 (A) 7.5 L of 3. Deep-frying process each ratio Temperature: 180°C **60:40** (D) Statistical Analysis 100 mL 100 mL 100 mL 100 mL Physicochemical quality of oils ANOVA using SPSS Batch of frying: 1st- 9th

#### **CONCLUSION AND RECOMMENDATIONS**

- Blending highly unsaturated soybean oil with coconut oil could enhance its thermal stability.
- Ratios 70:30 (% v/v) of soybean oil blended with coconut oil exhibited good thermal stability during deep-frying.
- Further studies should investigate the shelf-life of the oil and product.
- Other chemical properties of the oil, including total polar compound and fatty acids composition should be further addressed.

#### **RESULTS**



#### References

Meenu, M., Decker, E. A., & Xu, B. (2022). Application of vibrational spectroscopic techniques for determination of thermal degradation of frying oils and fats: a review. Critical Reviews in Food Science and Nutrition, Vol. 62, pp. 5744-5765. https://doi.org/10.1080/10408398.2021.1891520

**Batches** 

parameters,

Patil, R. S., Waghmare, J., & Annapure, U. (2023). Comparative assessment of the frying performance of palm olein and sunflower oil during deep-fat frying of Indian battered food products. Journal of Agriculture and Food Research, 14, 100778. <a href="https://doi.org/10.1016/j.jafr.2023.100778">https://doi.org/10.1016/j.jafr.2023.100778</a>