CARPATHIAN JOURNAL OF FOOD SCIENCE AND TECHNOLOGY

journal homepage: **http://chimie-biologie.ubm.ro/carpathian_journal/index.html**

Research article

CHARACTERISTICS OF AMYLUM, AMYLOGRAPH, AND SWELLING POWER OF YELLOW PUMPKIN FLOUR WITH DIFFERENT FERMENTATION TIMES

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https://doi.org/10.34302/2025.17.3.6

Article history:
Received:
March 6th, 2025
Accepted:
Novembre 10th , 2025

Keywords:
Gelatinization;
Yellow pumpkin;
Retrogradation;
Fermentation time.

Abstract

Yellow pumpkin flour has disadvantages, including reduced fluffiness and a strong water-binding capacity. This study aimed to analyze the effects of fermentation duration on the amylum characteristics, amylograph properties, and swelling power of yellow pumpkin flour to determine the optimal fermentation time. A randomized experimental design with one factor—fermentation duration—was used, consisting of six treatments (0 to 5 days of fermentation), with each treatment repeated four times. The parameters measured included amylum, amylose, amylopectin, amylograph, swelling power, pH, solubility, and moisture content. The results indicated that fermentation time significantly affected most parameters except gelatinization time. Extended fermentation improved amylograph properties by enhancing gelatinization and retrogradation, although paste stability during heating decreased. However, prolonged fermentation did not enhance the flour's ability to expand, but it did increase water-binding capacity. The study concluded that one-day fermentation was optimal, as it improved gelatinization, retrogradation, and solubility while maintaining a high swelling power in yellow pumpkin flour. This fermentation period produced flour with improved functional properties, making it more suitable for various food applications. Future research should explore further modifications to enhance expansion properties while maintaining the benefits of fermentation on yellow pumpkin flour's quality.