DEVELOPMENT OF SMART BIOPOLYMER FILMS FOR REAL-TIME MONITORING OF CHICKEN BREAST FRESHNESS

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INTRODUCTION

The inevitable spoilage of food products poses a risk to every consumer, and therefore the need to develop systems for real-time monitoring of food quality arises. In this regard, intelligent packaging systems are being developed that include natural pH-sensitive indicators. In this study, two types of biopolymer matrices, chitosan-starch and starch-gelatin, enriched with anthocyanins from purple cabbage extract were used to monitor chicken breast freshness. The anthocyanins act as natural pH-responsive sensors and as such they exhibit visible colour changes in response to spoilage-related pH variations.

MATERIALS AND METHODS

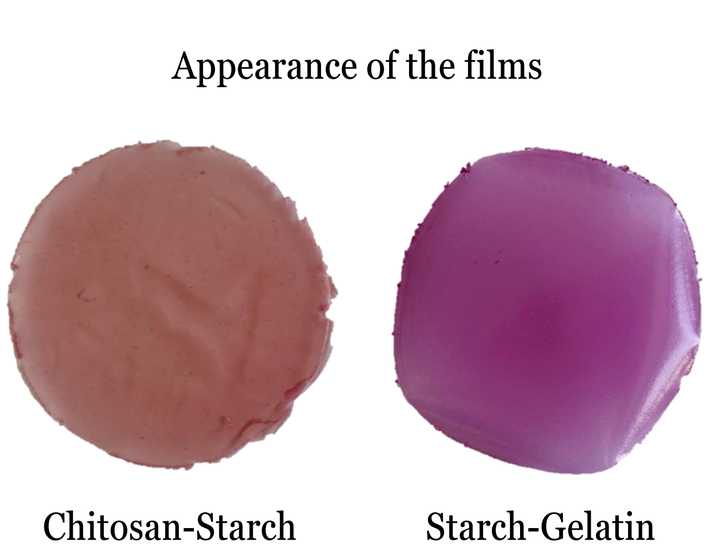
◇ The biopolymer films were obtained using the casting method

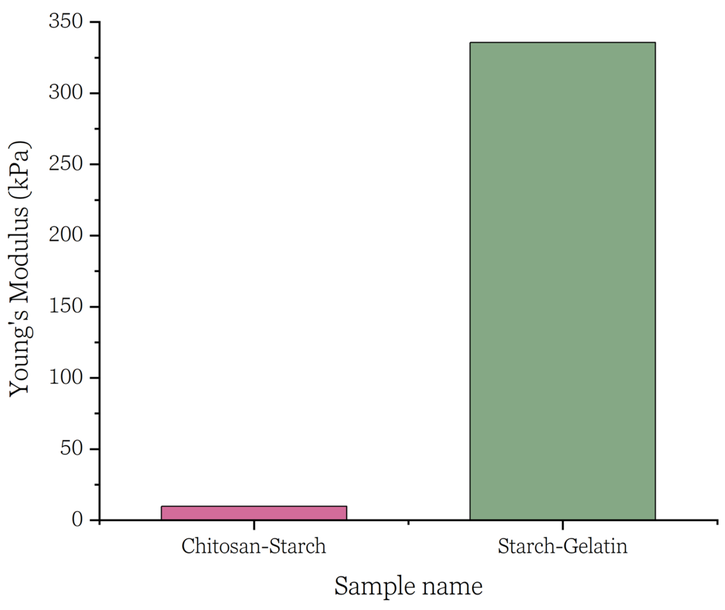
◇ Films were stored in a ventilated chamber at 50% relative humidity (RH) and 25°C prior to analysis.

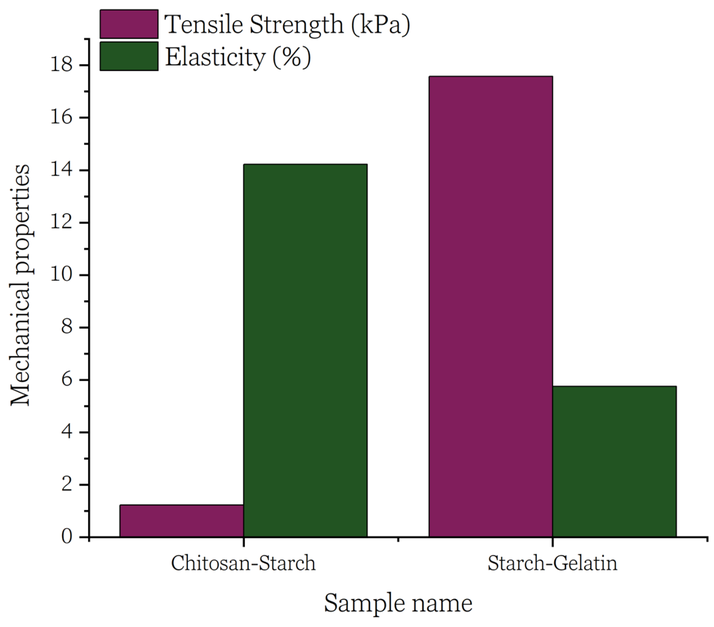
◇ The key properties of the films: mechanical characteristics, moisture content, water vapour permeability, optical properties and colour stability during storage were evaluated to determine if they are suitable for intelligent packaging applications.

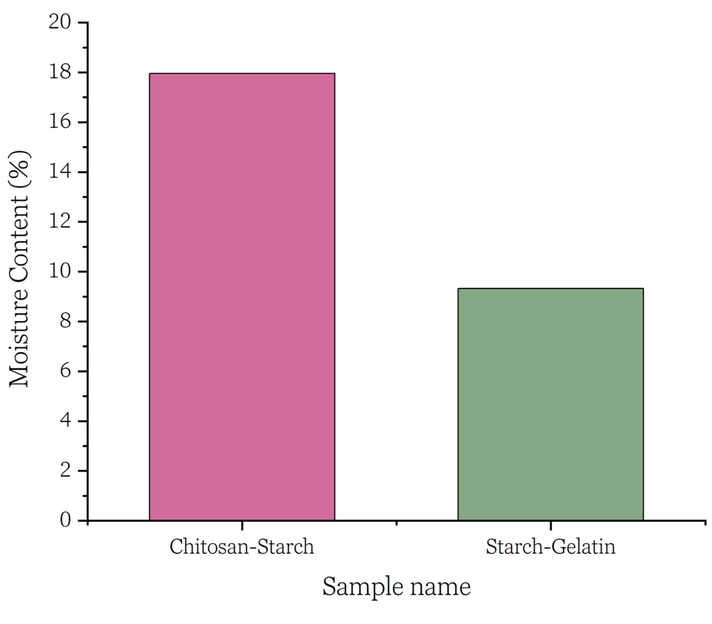
◇ The effectiveness of the films in detecting chicken breast freshness was assessed under different storage conditions: 4°C and 25°C.

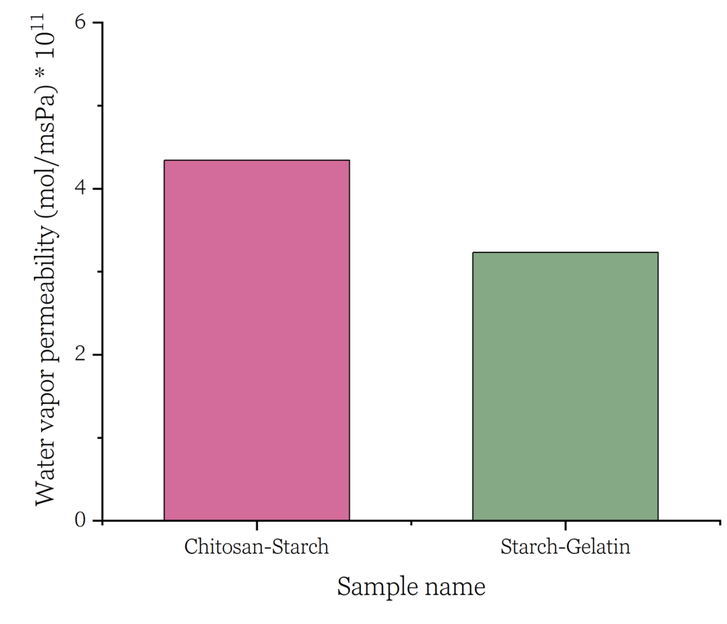
RESULTS AND CONCLUSIONS

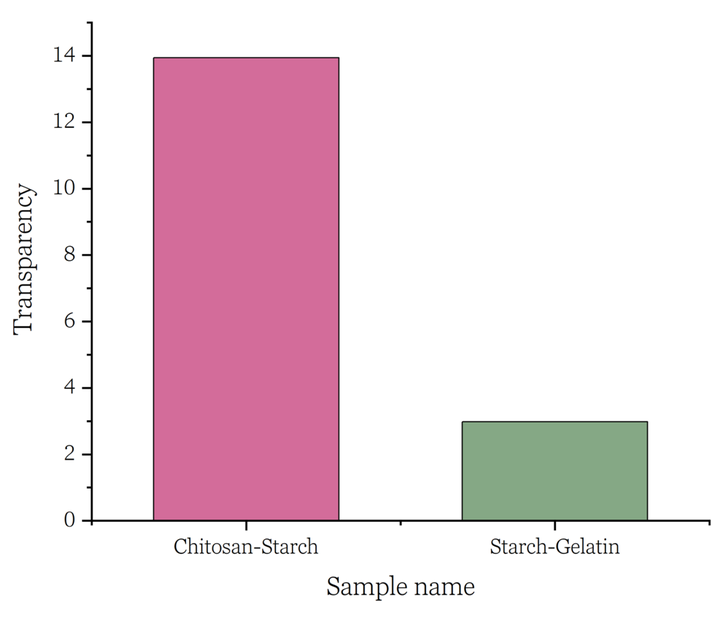












CHITOSAN-STARCH

◇ The findings suggest that the films effectively detect chicken breast spoilage while maintaining sufficient mechanical integrity and stability. The color of the film changes from light pink to a distinct green color, indicating the spoilage of the meat.

STARCH-GELATIN