

KARAKTERISTIK PENGERINGAN DAN PROFIL KIMIA TEMPE DENGAN PERLAKUAN LAMA FERMENTASI

INTISARI

Oleh:

OVERLINA JULIETA PUTRI ARDINA
20/456398/TP/12693

Tepung tempe merupakan produk olahan tempe yang diolah melalui proses pengeringan kemudian ditepungkan. Tempe yang dipilih merupakan tempe busuk yang memiliki banyak manfaat kesehatan. Tepung tempe menjadi inovasi produk olahan tempe untuk memperpanjang umur simpan. Tujuan dari penelitian ini yaitu menentukan koefisien perpindahan panas konveksi pada proses pengeringan tempe, mengetahui pengaruh variasi perlakuan terhadap laju pengeringan dan laju perubahan warna tempe selama proses pengeringan serta mengetahui pengaruh jenis kemasan dan umur simpan terhadap profil kimia tepung tempe.

Tempe diiris dengan ketebalan 0,5 cm kemudian dikeringkan menggunakan dehidrator dengan suhu 60°C selama 12 jam dengan perlakuan posisi rak. Selama proses pengeringan, perubahan massa, suhu, dan warna diamati dan dicatat dengan interval waktu 30 menit. Terdapat dua jenis kemasan yang dipakai, yaitu tempe daun dan tempe plastik. Selain itu, diberi perlakuan umur simpan hari ke-3, hari ke-5, hari ke-7, dan hari ke-9. Setelah dikeringkan, tempe diproses menjadi tepung tempe dan dilakukan uji profil kimia berupa protein dan asam glutamat. Data perubahan suhu dan massa digunakan untuk menganalisis koefisien perpindahan panas konveksi (h) dan konstanta laju pengeringan (k). Sedangkan data perubahan warna digunakan untuk menganalisis laju perubahan warna. Selain itu, data tersebut digunakan untuk analisis perubahan *lightness*, *hue angle*, dan *chroma*.

Hasil penelitian menunjukkan bahwa koefisien perpindahan panas konveksi (h) mengalami kenaikan hingga hari ke-7 dan menurun di hari ke-9. Nilai h tertinggi diperoleh pada tempe kemasan daun hari ke-7. Konstanta laju pengeringan (k) mengalami kenaikan hingga hari ke-7 dan menurun di hari ke-9. Nilai k tertinggi diperoleh pada tempe kemasan daun hari ke-7. Proses pengeringan menyebabkan perubahan warna tempe dari putih menjadi kecoklatan. Selain itu, perubahan warna pada tempe dipengaruhi oleh lama fermentasi, posisi rak, dan jenis kemasan. Kandungan protein dan asam glutamat pada tepung tempe semakin meningkat seiring lama fermentasi. Kadar protein dan asam glutamat tertinggi diperoleh pada tempe kemasan daun hari ke-9.

Kata Kunci: Tempe busuk, Tepung Tempe, Konveksi, Laju Pengeringan, Lama Fermentasi, Warna, Profil Kimia

DRYING CHARACTERISTICS AND CHEMICAL PROFILE OF TEMPE WITH VARIOUS FERMENTATION DURATION

ABSTRACT

By:

OVELINA JULIETA PUTRI ARDINA
20/456398/TP/12693

Tempe can be processed to flour by using dehydrator and grinder through process drying and milling. The selected tempe is over-fermented, known for its numerous health benefits. Tempe flour innovation extends the shelf life of tempe products. The objective of this research is to determine the convective heat transfer coefficient during the drying process of tempe, analyze the influence of treatment variations on drying rate and color change during the drying process, and to assess the influence of packaging type and shelf life on the chemical profile of tempe flour.

Tempe slices of 0,5 cm thickness were dried using a dehydrator at 60°C for 12 hours with different rack types. Mass, temperature, and color changes were observed and recorded every 30 minutes during the drying process. Two types of packaging, leaf tempe and plastic tempe, were used, along with fermentation duration treatments on day 3, day 5, day 7, and day 9. After drying, tempe was processed into tempe flour, and chemical profile analysis including protein and glutamic acid content was conducted. Data on temperature and mass changes were used to analyze the convective heat transfer coefficient (h) and drying rate constant (k). Color change data were analyzed for rate of color change, lightness, hue angle, and chroma.

The research findings indicate that the convective heat transfer coefficient (h) experienced an increase until the 7th day and decreased on the 9th day. The highest value of h was obtained in leaf-packaged tempeh on the 7th day. The constant drying rate (k) increased until the 7th day and decreased on the 9th day. The highest value of k was obtained in leaf-packaged tempeh on the 7th day. The drying process caused a color change in tempeh from white to brownish. Additionally, the color change in tempeh was influenced by fermentation time, rack position, and packaging type. The protein and glutamic acid content in tempeh flour increased with fermentation time. The highest protein and glutamic acid content were obtained in leaf-packaged tempeh on the 9th day.

Keywords: Overfermented Tempe, Tempe Flour, Convection, Drying Rate, Fermentation Duration, Color, Chemical Profile