BÖLÜM 3

MİKRODALGA KURUTMANIN MANTARLARIN KURUTMA KİNETİĞİ, ENERJİ ÖZELLİKLERİ VE RENK PARAMETRELERİ ÜZERİNE ETKİSİ

Necati ÇETİN[1]

1. GİRİŞ

Birçok ülkede yaygın olarak tüketilen mantar (*Agaricus bisporus*), yüksek protein, vitamin, lif, sakkarit ve mineral içeriği ile besleyici ve lezzetli bir üründür (Walde ve ark., 2006). Dünyada üretilen tüm mantarların yaklaşık %50'si taze olarak tüketilmektedir. Mantarlar hasat edildikten sonra yüksek nem oranları (yaklaşık %90) ve enzim içeriği sebebiyle sadece 1-7 arasında muhafaza edilebilmektedir (Jiang, 2013). Bu nedenle mantarlar, raf ömrünü uzatmak, tat ve aromasını korumak amacıyla en sık uygulanan muhafaza yöntemi olarak kurutma işlemine tabi tutulmaktadır (Giri ve Prasad, 2007). Kurutulmuş mantarlar hazır çorba ve pizza sanayiinde hammadde olarak, çeşitli sos ürünleri ve bebek mamalarında yardımcı malzeme olarak veya işlenerek kullanılmaktadır (Arumuganathan ve ark., 2009; Isik ve İzli, 2014).

Gıda kurutma ilkesi, genellikle %1 ile %5 arasında değişen bir nem içeriği seviyesine kadar gıdadan serbest suyu uzaklaştırarak mikrobiyal büyümeyi azaltmaktır (Vega-Marcedo, 2001; Krokida ve ark., 2003). Kurutma, genellikle gıdaların hacimlerinde ve ağırlıklarında azalmaya yol açar. Kurutulmuş ürünler, uygun

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4. SONUÇ

Bu çalışmada mantar dilimleri üç farklı mikrodalga kurutma işlemine tabi tutulmuştur. Logistic ve Wang & Singh modelleri deneysel veriler için en uygun modeller olarak belirlenmiştir. Renk özellikleri bakımından en yüksek sonuçlar 300W kurutmada elde edilirken, rehidrasyon için en yüksek sonuçlar 100W ve 200W kurutmada elde edilmiştir. Toplam enerji tüketimi ve kurutma süresi en yüksek olan sistem 100W olurken enerji ve termal etkinlik açısından en efektif sistem 300W olmuştur. En yüksek D_{eff} değeri ise 300 W mikrodalga gücünde belirlenmiştir.

Bu çalışmada elde edilen sonuçlar, geliştirilen tüm modellerin kuruma özelliklerinin tahmin edilmesi için uygun olduğunu göstermektedir. Çalışmada en düşük RMSE değerine sahip modeller nem içeriği için 0.008 ile MLP (4-5-1), nem oranı için 0.015 ile MLP (4-15-1) ve kuruma hızı için 0.069 ile MLP (4-10-1) olmuştur. Bulgular, yapay sinir ağı modellerinin farklı kurutma parametrelerini tahmin etmek için etkili bir araç olduğunu ve akıllı kurutma sistemleri geliştirmek için bu modellerin kullanılabileceğini göstermiştir. Farklı kurutma şartlarının nihai ürün kalitesi üzerindeki etkilerini araştırmak için farklı yapay zekâ algoritmalarının kullanılarak daha fazla araştırma yapılması önerilmektedir.

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