

**MATHEMATICAL ANALYSIS OF THE EFFECT OF VARIOUS PRE-TREATMENTS AND DRYING TIME ON THE QUALITY OF DEHYDRATED PERSIMMON**

**ABSTRACT**

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Persimmon (*Diospyros kaki*) was consumed at fresh and also dried condition. Dried persimmon became expensive and outstanding product due to the high nutrition. In this experiment we applied some pre-treatment on dehydrated persimmon to produce high quality fruit. Fresh persimmon fruits were treated with 4 different pre-treatments (cooling at 1°C, ethanol, CO<sub>2</sub> and untreated fruit as control). Fruits were dried for 4 days using cabinet dryer at 35°C. Quality of dried persimmon were analyzed mathematically, involved color, flesh firmness, moisture content and soluble tannin content.

Analysis of color divided into two parameters, chroma and hue angle. After 4 days of drying, hue angle value on all treated fruit decreased and treatments were not significantly affected to hue angle value. Chroma of dehydrated persimmons were affected by pre-treatment and drying time. CO<sub>2</sub> and 1°C-treated fruit produced higher value of chroma. Same as chroma value, flesh firmness, moisture content and soluble tannin were also significantly affected by interaction between pre-treatment and drying time. Flesh firmness of CO<sub>2</sub>-treated fruit was higher than other treated fruit, about 20,23 N and ethanol treatment generated lower firmness, about 9,38 N. Moisture content on dehydrated persimmon decreased after 4 days and CO<sub>2</sub>-treated fruit had higher moisture content, about 41,51% than other treated fruit. Soluble tannin that responsible to astringent sense on persimmon also decreased after pre-treatment on CO<sub>2</sub> and ethanol treatment, however after 4 days of drying all treated fruit had similar content of soluble tannin about 283,30- 314,68 mg/100g (dry weight), except 1°C- treated fruit that had higher content, about 890,87 mg/100g (dry weight).

**Keywords:** chroma, dehydrated persimmon, flesh firmness, hue angle, moisture content, pre-treatment, soluble tannin

## ANALISIS MATEMATIKA EFEK BEBERAPA *PRE-TREATMENT* DAN WAKTU PENGERINGAN TERHADAP KUALITAS BUAH KESEMMEK TERDEHIDRASI

### INTISARI

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Kesemek (*Diospyros kaki*) adalah buah yang dikonsumsi dalam kondisi segar dan juga kering. Kesemek kering merupakan produk dengan harga tinggi karena kandungan nutrisi yang tinggi. Pada penelitian ini, kami menerapkan beberapa *pre-treatment* yang terdiri atas 4 macam (pendinginan suhu 1°C, ethanol, CO<sub>2</sub>, dan buah control). Buah dikeringkan selama 4 hari menggunakan pengering kabinet pada suhu 35°C. Kualitas buah selanjutnya dianalisis secara matematika meliputi, warna, kekerasan buah, kadar air, dan tanin terlarut.

Analisis warna dibagi menjadi 2 yaitu, kroma dan *hue angle*. Setelah 4 hari pengeringan, *Hue angle* pada semua perlakuan menurun dan *pre-treatment* memberikan pengaruh tidak nyata terhadap perubahan *hue angle*. Kroma dari kesemek terdehidrasi dipengaruhi oleh *pre-treatment* dan waktu pengeringan. Perlakuan CO<sub>2</sub> dan 1°C menghasilkan buah dengan nilai kroma yang tinggi. Interaksi antara *pre-treatment* dan waktu pengeringan juga berpengaruh pada kekerasan buah, kadar air, dan tanin terlarut. Buah yang diberi perlakuan CO<sub>2</sub> memiliki kekerasan paling tinggi sebesar 20,23 N, sedangkan perlakuan dengan etanol menghasilkan buah yang lebih lunak dengan kekerasan 9,38 N. Kadar air setelah pengeringan 4 hari pada buah yang diberi perlakuan CO<sub>2</sub> adalah paling rendah yaitu 41,51 % daripada buah dengan perlakuan lain. Tanin terlarut yang menyebabkan rasa sepat pada kesemek juga mengalami penurunan setelah *pre-treatment* pada buah yang diberi perlakuan CO<sub>2</sub> dan etanol, namun setelah 4 hari pengeringan semua buah memiliki kandungan tanin terlarut yang tidak berbeda nyata, yaitu 283,30- 314,68 mg/100g (dry weight), kecuali buah dengan perlakuan 1°C, yaitu 890,87 mg/100g (dry weight).

**Keywords:** *hue angle*, kadar air, kekerasan buah, kroma, kesemek terdehidrasi, *pre-treatment*, tanin terlarut