

## Analisis Regresi Untuk Evaluasi Mutu Jeruk Selama Penyimpanan Berdasarkan Fitur Citra Digital

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<b>Abstract</b>	<p>Abstrak. Buah jeruk mudah mengalami penurunan mutu selama penyimpanan. Pengetahuan tentang perubahan mutu jeruk perlu diketahui karena menjadi faktor yang mempengaruhi proses penanganan selanjutnya. Penelitian ini bertujuan untuk mengidentifikasi perubahan karakteristik fisik, mekanik, kimia dan optik buah jeruk selama penyimpanan pada suhu ruang serta mengetahui korelasi kualitas buah jeruk dengan fitur citranya menggunakan analisis regresi. Sebanyak 135 sampel jeruk disimpan pada suhu ruang (25-27 oC) selama 40 hari. Buah jeruk ditangkap citranya menggunakan webcam kemudian diukur karakteristik fisik (bobot dan diameter), mekanik (kekerasan dan koefisien gesek), dan kimia (total padatan terlarut). Fitur citra yang dianalisis adalah area citra biner, warna RGB, warna HSV, warna CIE-Lab, warna abu-abu dan fitur tekstur. Hasil penelitian menunjukkan bahwa area citra biner memiliki korelasi yang kuat terhadap bobot dan diameter buah jeruk dengan koefisien determinasi (R<sup>2</sup>) masing-masing sebesar 0,8285 dan 0,8282. Kekerasan dan koefisien gesek statis buah jeruk mempunyai korelasi yang rendah terhadap fitur citra abu-abu. Total padatan terlarut jeruk yang disimpan pada suhu ruang mempunyai korelasi yang cukup kuat dengan rata-rata nilai Hue dengan R<sup>2</sup>= 0,7473 dan rata-rata nilai kroma a* dengan R<sup>2</sup>= 0,7029. Analisis warna dengan teknik pengolahan citra dapat diaplikasikan untuk menduga beberapa karakteristik mutu buah jeruk. Regression Analysis for Orange Quality Evaluation during Storage Based on Image Color Features</p> <p>Abstract. Orange fruits can easily deteriorate during storage. Information about quality changes of orange fruits is essential to figure out since it can be a key factor that will affect further fruit handlings. This research aimed to identify the changes of physical, mechanical, chemical and optical properties of orange during storage at room temperature as well as to discover the correlation between orange quality and image features by means of regression analysis. A sample size of 135 oranges was stored in a room temperature (25-27 oC) for 40 days. Each orange was captured its image using a webcam and was subsequently measured its physical, mechanical and chemical characteristics, i.e. weight, diameter, hardness, static friction coefficient, and total soluble solids (TSS). Several image features, i.e. binary area, RGB color, HSV color, CIE-Lab color, gray value, and texture features, were then measured. The results showed that there was a high correlation between fruit weight and diameter and binary area with R<sup>2</sup> = 0.8285 and R<sup>2</sup> = 0.8282, respectively. On the other hand, color values had low correlation with fruit hardness and static friction coefficient. Likewise the physical properties, the chemical properties of orange fruit had a relatively strong correlation with image color. Based on the experiments, the R<sup>2</sup> values of the correlation between hue value of HSV color model and a* component of CIE-Lab color and orange TSS were 0.7473 and 0.7029, respectively. Color analysis with image processing technique can be applied to estimate several orange properties.</p>
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