ABSTRAK

EFEKTIVITAS PENGGUNAAN *ACTIVE PACKAGING* BERBAHAN *ETHYLENE*, *HUMIDITY*, DAN *OXYGEN SCAVENGER* DALAM MENGHAMBAT PENURUNAN KUALITAS DAN MEMPERPANJANG MASA SIMPAN BUAH STROBERI PADA SUHU DINGIN

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Stroberi sangat bernilai ekonomis tetapi mudah rusak karena teksturnya yang lembut dan kadar air tinggi. *Active packaging* merupakan teknologi pengemasan inovatif yang mampu memperpanjang umur simpan produk dengan mengendalikan kondisi internal kemasan. Penelitian ini bertujuan mengevaluasi efektivitas a*ctive packaging* yang mengandung $KMnO_4$, vitamin C, dan *silica-gel* sebagai terhadap kualitas stroberi selama penyimpanan 8 hari pada suhu 18° C. Penelitian menggunakan Rancangan Acak Lengkap (RAL) faktorial (2 × 2 × 3) dengan lima ulangan. Parameter yang diamati meliputi susut bobot, TPT (°Brix), keasaman, dan vitamin C. Hasil penelitian menunjukkan bahwa terdapat interaksi nyata antara $KMnO_4$, vitamin C, dan *silica-gel* terhadap seluruh parameter pengamatan. Susut bobot tertinggi dicapai pada perlakuan K1V1S2 (19,42%), sedangkan terendah pada K0V0S0 (12,16%). Nilai °Brix tertinggi diperoleh pada K0V0S2 sebesar 5,68%. Kandungan asam tertinggi terdapat pada K1V0S2 (5,80%), sedangkan total gula tertinggi tercatat pada K1V0S1 (8,08 g/100 g). Kadar vitamin C berkisar antara 0.02-0.03 g/100 mL dan tidak menunjukkan adanya perbedaan nyata antar perlakuan. Secara umum penggunaan *silica-gel* memberikan pengaruh paling besar terhadap peningkatan susut bobot akibat penyerapan kelembapan yang berlebihan. Penggunaan $KMnO_4$ dan vitamin C cenderung lebih efektif dalam mempertahankan kualitas buah pada kondisi kelembapan yang optimal. Dengan demikian, formulasi a*ctive packaging* perlu disesuaikan agar mampu mempertahankan kualitas stroberi secara optimal selama penyimpanan.

Kata kunci: Stroberi, a*ctive packaging*, $KMnO_4$, vitamin C, s*ilica-gel*.

ABSTRACT

EFFECTIVENESS OF USING ACTIVE PACKAGING BASED ON ETHYLENE, HUMIDITY, AND OXYGEN SCAVENGERS IN INHIBITING QUALITY DECREASE AND EXTENDING THE SHELF-LIFE OF STRAWBERRIES AT COLD TEMPERATURE

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Strawberries are highly perishable due to their soft texture and high moisture content. Active Packaging is an innovative technology that extends shelf life by actively controlling the internal environment of packaging. This study aimed to evaluate the effectiveness of Active Packaging containing $KMnO_4$ (ethylene scavenger), vitamin C (oxygen scavenger), and silica-gel (humidity absorber) on the physical and chemical quality of strawberries stored at 15°C. A factorial Completely Randomized Design (2 × 2 × 3) with five replications was used. Observed parameters included weight loss, total soluble solids (°Brix), titratable acidity, and vitamin C content. The results showed significant interactions among $KMnO_4$, vitamin C, and silica-gel for all parameters ($p<0.05$). The highest weight loss occurred in treatment K1V1S2 (19.42%), while the lowest was found in K0V0S0 (12.16%). The highest °Brix value was recorded in K0V0S2 (5.68%). The highest acidity was observed in K1V0S2 (58.05%), and the highest total sugar content occurred in K1V0S1 (8.08 g/100 g). Vitamin C levels reached up to 30 mg/100 mL in several combinations with $KMnO_4$ and vitamin C. Overall, silica-gel had the greatest influence on physical deterioration, particularly weight loss. $KMnO_4$ and vitamin C performed more effectively under moderate humidity conditions. These findings indicate that active packaging formulation must be carefully adjusted to maintain strawberry quality during storage.

Keyword:Strawberry, Active Packaging, $KMnO_4$, Vitamin C, Silica-gel