

**MATHEMATICAL ANALYSIS THE EFFECTS OF OXYGEN ABSORBER WEIGHT INSIDE THE PACKAGE AND PLASTIC FILM THICKNESS ON THE RESPIRATION RATE AND QUALITY CHANGES OF CURLY RED CHILI (*Capsicum annuum L.*) DURING STORAGE**

**ABSTRACT**

**By:**

**Aninda Dyah Nugrahaini**

**15/385433/TP/11302**

Curly red chili (*Capsicum annuum L.*) is one of the agricultural commodities which has high economic value and widely consumed by the community in fresh condition. However, curly red chili is susceptible to damage because it has high moisture content so that its shelf life is short. One effort to extend the shelf life of curly red chili can be done by using Modified Atmosphere Packaging (MAP) to reduce the respiration rate of curly red chili. This study aimed to investigate the effects of the weight variations of O<sub>2</sub> absorber inside the package and plastic film thickness on the respiration rate and quality of curly red chili. O<sub>2</sub> absorber variations applied were 0 sachet, 1 sachet, and 2 sachets with 5 gr/sachet and the variations of plastic thickness were 0.03 mm, 0.05 mm, and 0.08 mm with 30 days of storage in the temperature of 5±1<sup>0</sup>C. During storage period were done measurements of respiration rate, loss of weight, firmness, brix, and color. Overall, the study shows that respiration rate (RO<sub>2</sub>) ranges between 0.178–1.12 ml/kg.hour, RCO<sub>2</sub> between 0.215–0.987 ml/kg.hour, loss of weight between 0.31–9.51%, brix between 4.8–8.9% brix, firmness 0.52–2.26 kgf, and color lightness 11.89–36.92; chroma 23.55–56.27; hue angle 0.096–0.684, and ΔE (total color difference) 7.43–40.85. These results of statistical analysis show that addition of O<sub>2</sub> absorber significantly affects respiration rate and hue angle, while plastic film thickness significantly affects respiration rate, lost of weight, brix, firmness, hue angle, and chroma. The best treatment is to keep curly red chili in 0.08 mm plastic wrap with 1 sachet of O<sub>2</sub> absorber.

**Keywords:** curly red chili, oxygen absorber, modified atmosphere packaging

**ANALISIS MATEMATIS PENGARUH VARIASI BERAT *OXYGEN ABSORBER* DALAM KEMASAN DAN TEBAL PLASTIK KEMASAN TERHADAP LAJU RESPIRASI DAN PERUBAHAN KUALITAS CABAI MERAH KERITING (*Capsicum annuum L.*) SELAMA PENYIMPANAN**

**INTISARI**

**Oleh:**

**Aninda Dyah Nugrahaini**  
**15/385433/TP/11302**

Cabai merah keriting (*Capsicum annuum L.*) merupakan salah satu komoditas pertanian yang bernilai ekonomi tinggi dan banyak dikonsumsi oleh masyarakat dalam kondisi segar. Akan tetapi, cabai merah keriting rentan mengalami kerusakan karena memiliki kadar air yang tinggi sehingga umur simpannya pendek. Salah satu upaya untuk memperpanjang umur simpan cabai merah keriting dapat dilakukan dengan menggunakan MAP (*modified atmosphere packaging*) untuk menghambat laju respirasi cabai merah keriting. Penelitian ini bertujuan untuk mengkaji pengaruh berat absorber O<sub>2</sub> dalam kemasan dan tebal plastik kemasan terhadap laju respirasi dan kualitas cabai merah keriting. Variasi absorber O<sub>2</sub> yang digunakan adalah 0 sachet, 1 sachet, dan 2 sachet dengan berat 5 gr/sachet serta variasi tebal kemasan plastik 0,03 mm, 0,05 mm dan 0,08 mm dengan lama penyimpanan 30 hari pada suhu penyimpanan 5±1<sup>0</sup>C. Selama penyimpanan dilakukan pengukuran respirasi, susut bobot, kekerasan, brix, dan warna. Secara umum, hasil penelitian menunjukkan laju respirasi (RO<sub>2</sub>) berkisar antara 0,178-1,12 ml/kg.jam, (RCO<sub>2</sub>) berkisar antara 0,215-0,987 ml/kg.jam, susut bobot berkisar antara 0,31-9,51%, brix berkisar antara 4,8-8,9% brix, kekerasan berkisar antara 0,52-2,26 kgf, dan warna (lightness 11,89-36,92; chroma 23,55-56,27; hue angle 0,096-0,684, dan ΔE (total perbedaan warna) 7,43-40,85). Hasil analisis statistik menunjukkan bahwa penambahan absorber O<sub>2</sub> secara signifikan mempengaruhi laju respirasi dan hue angle. Sedangkan tebal kemasan plastik secara signifikan mempengaruhi laju respirasi, susut bobot, brix, kekerasan, hue angle, dan chroma. Perlakuan yang terbaik adalah cabai merah keriting yang disimpan pada tebal kemasan plastik 0,08 mm dengan absorber O<sub>2</sub> 1 sachet.

Kata kunci : cabai merah keriting, *oxygen absorber*, *modified atmosphere packaging*