

**ANALISIS MATEMATIS PENGARUH TINGKAT *PRECOOLING*  
DAN KARAKTERISTIK LAJU RESPIRASI  
TERHADAP PERUBAHAN KUALITAS FISIK PRODUK SEGAR  
SELAMA PROSES PENYIMPANAN**

**INTISARI**

**Oleh:**

**KIKI MULYASAFITRI**

**15/385456/TP/11325**

Sayuran merupakan salah satu komoditas hortikultura yang banyak dibutuhkan manusia dalam memenuhi kebutuhan gizi. Setelah pemanenan, sayuran masih mengalami proses respirasi yang menyebabkan penurunan kualitas fisik dan umur simpan menjadi pendek. Salah satu penanganan pascapanen untuk mengatasi hal tersebut adalah dengan perlakuan *precooling*. Penelitian ini bertujuan untuk mempelajari pengaruh tingkat *precooling* dan karakteristik laju respirasi terhadap kualitas fisik produk segar (sayuran) selama penyimpanan. Bahan yang digunakan adalah sayuran dengan karakteristik laju respirasi berbeda yaitu kentang (5-10 mgCO<sub>2</sub>/kg.jam), bawang prei (20-40 mgCO<sub>2</sub>/kg.jam), dan jamur tiram (>60 mgCO<sub>2</sub>/kg.jam) dengan perlakuan tingkat *precooling* T1/2, T3/4, dan T7/8. Sampel kentang disimpan selama 30 hari, bawang prei selama 5 hari, dan jamur tiram selama 3 hari pada suhu penyimpanan 5°C. Parameter yang diamati meliputi laju pendinginan, laju konsumsi O<sub>2</sub>, laju produksi CO<sub>2</sub>, total padatan terlarut, pH, kekerasan, *lightness*, *hue angle*, *chroma* dan *color difference*. Data hasil pengukuran kemudian dianalisis secara statistika dan kinetika. Variasi karakteristik laju respirasi berpengaruh terhadap semua parameter pengukuran selama penyimpanan. Variasi tingkat *precooling* tidak berpengaruh terhadap laju respirasi O<sub>2</sub> dan CO<sub>2</sub>, *hue angle*, *color difference*, kekerasan, serta pH selama penyimpanan. Sedangkan total padatan terlarut, *lightness*, dan *chroma* selama penyimpanan dipengaruhi oleh interaksi variasi tingkat *precooling* dan karakteristik laju respirasi. Penentuan kombinasi perlakuan terbaik ditentukan menggunakan metode TOPSIS dan diperoleh kombinasi perlakuan terbaik terdapat pada kentang perlakuan tingkat *precooling* T1/2, bawang prei perlakuan tingkat *precooling* T3/4, dan jamur tiram perlakuan tingkat *precooling* T3/4.

Kata kunci: hortikultura, karakteristik laju respirasi, *precooling*, penyimpanan

**MATHEMATICAL ANALYSIS OF THE EFFECT OF PRECOOLING  
LEVEL AND RESPIRATION RATE CHARACTERISTIC  
ON PHYSICAL QUALITY CHANGES OF FRESH PRODUCTS  
DURING THE STORAGE PROCESS**

**ABSTRACT**

**By:**

**KIKI MULYASAFITRI**

**15/385456/TP/11325**

Vegetables are one of the horticultural products needed by humans in meeting nutritional needs. After harvesting, respiration process of vegetables was still continued that causes a decrease in physical quality and a short shelf lifetime. One of the postharvest handling to overcome this problem is the precooling treatment. This study aims to analyze the effect of precooling levels and respiration rate characteristics on the physical quality of fresh products (vegetables) during storage. The ingredients used are vegetables with different respiration rate characteristics, namely potatoes (5-10 mgCO<sub>2</sub>/kg.hour), leeks (20-40 mgCO<sub>2</sub>/kg.hour), and oyster mushrooms (>60 mgCO<sub>2</sub>/kg.hour) with precooling treatment levels T1/2, T3/4, and T7/8. Potato samples were stored for 30 days, leeks for 5 days, and oyster mushrooms for 3 days at 5°C. The parameters observed were cooling rate, O<sub>2</sub> consumption rate, CO<sub>2</sub> production rate, total dissolved solids, pH, hardness, lightness, hue angle, chroma and color difference. The measurement data is then analyzed statistically and kinetically. Variations in the respiration rate characteristics affect all measurement parameters during storage. Variation in the precooling level does not affect the O<sub>2</sub> and CO<sub>2</sub> respiration rate, hue angle, color difference, hardness, and pH during storage. Whereas total dissolved solids, lightness, and chroma during storage are influenced by the interaction of variations in the precooling level and the respiration rate characteristics. Determination of the best treatment combination was determined using the TOPSIS method and the best treatment combination was found in the potato T1/2 cooling, leeks T3/4 cooling, and oyster mushroom T3/4 cooling.

**Keywords:** horticulture, respiration rate characteristics, precooling, storage