# RINGKASAN

Tomat (*Solanum lycopersicum L*) merupakan produk pertanian yang mudah rusak dan termasuk ke dalam kategori klimaterik. Kualitas tomat perlu dipertahankan dengan penanganan pascapanen yang tepat seperti *edible coating*. Bahan baku pembuatan *edible coating* dapat berasal dari golongan polisakarida diantaranya adalah *hydroxypropyl methylcelluose* (HPMC) dan kitosan. Salah satu teknik aplikasi *edible coating* adalah *layer-by-layer* (LbL) yang banyak dilakukan dengan pencelupan sehingga kurang efisien dan higenis, maka dari itu terdapat alternatif aplikasi penyemprotan. Pengembangan alat seperti *manual air-pressure sprayer* yang lebih mudah, murah, dan aplikatif masih belum banyak dikaji. Tujuan dari penelitian ini adalah mengetahui 1) konsentrasi HPMC yang sesuai untuk aplikasi *edible coating,* 2) konsentrasi kitosan yang sesuai untuk aplikasi *edible coating* dan 3) pengaruh perbedaan metode aplikasi dan susunan *layer* terhadap kualitas fisik dan kimia tomat dengan menggunakan *edible coating layer-by-layer*.

Penelitian terdiri dari dua tahap meliputi pemilihan konsentrasi HPMC dan kitosan dalam bentuk *edible film* kemudian dilanjutkan aplikasi pada produk pangan. Rancangan penelitian yang digunakan pada tahap pertama adalah Rancangan Acak Lengkap (RAL) dengan perlakuan perbedaan konsentrasi masing-masing HPMC (H1 = 0,4%; H2 = 0,8%; dan H3 = 1,2% (b/v)) dan kitosan (N1 = 0,5%; N2 = 1,0%; dan N3 = 1,5% (b/v)). Variabel yang diamati pada tahap ini meliputi viskositas, ketebalan, transparansi, warna, kadar air, laju transmisi uap air, *biodegradability*, kuat tarik, dan perpanjangan. Kemudian dipilih masing-masing satu konsentrasi yang akan diaplikasikan pada tomat di tahap kedua. Rancangan penelitian yang digunakan adalah Rancangan Acak Lengkap (RAL) faktorial dengan perlakuan perbedaan susunan *layer* (L1 = 1-lapis HPMC, L2 = 1-lapis kitosan, L3 = LbL kitosan/HPMC, L4 = LbL HPMC/kitosan, dan L5 = 1-lapis komposit) dan metode aplikasi (T1 = pencelupan, T2 = *air gun sprayer*, dan T3 = *manual air pressure sprayer*). Tomat diamati setiap 6 hari sekali selama 24 hari penyimpanan meliputi susut bobot, warna, kekerasan, total padatan terlarut, total asam tertitrasi, dan juga vitamin C.

Hasil analisis pada tahap pertama menunjukkan bahwa perbedaan konsentrasi berpengaruh nyata pada peningkatan parameter viskositas, ketebalan, warna, transparansi, kadar air, dan kuat tarik. Sementara itu, perbedaan konsentrasi kitosan berpengaruh nyata pada peningkatan parameter viskositas dan warna serta penurunan kadar air. Perlakuan terpilih yang didapat adalah HPMC dengan konsentrasi 0,4% dan kitosan dengan konsentrasi 0,5%. Hasil analisis penelitian tahap kedua secara umum menunjukkan bahwa penggunaan *edible coating* dapat mempertahankan kualitas fisik dan kimia 12 hari lebih lama dibanding kontrol. Kombinasi perlakuan terpilih pada peneltian ini adalah perlakuan CH/HPMC yang diaplikasikan dengan *air gun sprayer*.

## SUMMARY

*Tomatoes (Solanum lycopersicum* L*) is a climateric and perishable commodity. It requires appropriate post-harvest handling to maintain the respiration rate after harvesting. Edible coating can be the option because of its safety and environmentally friendly. Polysaccharide, protein, and lipid are common material currently used for making edible coating, including hydroxypropyl methylcellulose (HPMC) and chitosan. Layer-by-layer (LbL) is known as the method for edible coating application, however its application still using dipping technique, which is not hygienic and efficient. Spraying methods can be used to overcome those issue. The development of tools such as manual air-pressure sprayers that are easier, cheaper, and applicable has not yet been widely studied. The aim of this research is to determine 1) the appropriate concentrations of HPMC for edible coating application, 2) chitosan concentration for edible coating application, and 3) the effect of difference application methods and layer arrangements regarding the physical and chemical quality of tomatoes.*

*This research consists of two stages including selecting the concentration of the material (HPMC and chitosan) using edible films. The research design used was a Completely Randomized Design (CRD) with different concentrations of HPMC ((H1 = 0,4%; H2 = 0,8%; dan H3 = 1,2% (w/v)) and chitosan (N1 = 0,5%; N2 = 1,0%; dan N3 = 1,5% (w/v)) as a treatment. Several observations at this stage including viscosity, thickness, transparency, color, water content, water vapor transmission rate, biodegradability, tensile strength, and elongation. Once concentration of each material is selected, the second stage conducted using factorial Completely Randomized Design (CRD). The treatments including layer arrangement (L1 = 1-layer HPMC, L2 = 1-layer chitosan, L3 = LbL chitosan/HPMC, L4 = LbL HPMC/chitosan, and L5 = 1-layer composite) and application method (T1 = dipping, T2 = air gun sprayer, and T3 = manual air pressure sprayer) on tomatoes. Tomatoes were observed every 6 days during 24 days of storage including weight loss, color, hardness, total soluble solids, total titrated acids, and vitamin C.*

*The results of the analysis in the first stage showed that the difference concentration of HPMC had a significant effect on increasing the parameters of viscosity, color, transparency, water content and tensile strength. Meanwhile, the increase in thickness and elongation, as well as the decrease in water vapor transmission rate, show no significant differences. On the other hand, differences concentration of chitosan had a significant effect on increasing viscosity, thickness, and color parameters as well as decreasing water content and had no significant effect on increases of transparency, tensile strength, elongation and the WVTR. The selected concentration was 0.4% HPMC and 0.5% chitosan (w/v). The results of the second stage generally show that edible coating can maintain physical and chemical quality for up to 24 days, while the control treatment only lasts 12 days. The chosen treatments in this research were CH/HPMC with an air gun sprayer method application.*