

Disain dan Uji Kinerja Pendingin Evaporatif Tipe Aliran Searah Menggunakan CFD (Computational Fluid Dynamics)

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Abstract	<p>After harvesting, fruits will change due to physiological, physical, chemical, and microbiological influences, and they are living materials. Therefore, it is necessary to know how to harvest and handle fresh fruits and their storage conditions to handle the fruits after harvesting so that the quality of the products can be maintained. One of the first treatments in the fruit cold chain is evaporative cooling. In order to get an evaporative cooling system that has an even temperature distribution, it is necessary to make a spatial model when designing an evaporative cooling system using CFD (Computational Fluid Dynamics). The objectives of this research are: (1) design of direct flow type evaporative cooling systems and (2) test the performance of direct flow type evaporative coolers. This research method uses design methods, experiments, and computer simulations. The results showed the performance of the evaporative cooler system in the scenario with the roof on, the highest effectiveness value was 1.198, the highest approximation value was 2.832, and the highest range value was 4.589. In the scenario without a roof on the evaporative cooler system, the highest effectiveness value was 1.767, the highest approach value was 2.139, and the highest range value was 4.835. The CFD analysis in the scenario with a roof had the highest temperature value of 25.9 °C and the lowest temperature of 21.9 °C, while the CFD analysis in the scenario without roof had the highest temperature of 23.7 °C and the lowest temperature of 20.4 °C. Keywords: CFD, direct flow type, evaporative cooler, quality, fruit</p>
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