

INTISARI

Berdasarkan data yang didapatkan dari Badan Pusat Statistik, produksi tanaman kunyit pada tahun 2021 yaitu sebesar 184.825 ton dan mengalami peningkatan sebesar 6,32% di tahun 2022 yaitu menjadi 196.499 ton. Kunyit memiliki beberapa komponen terkandung salah satunya kurkumin yang dapat berperan sebagai antikanker, antiinflamasi, antioksidan, bahkan antiinfeksi (Wilken, Veena, Wang, & Srivatsan, 2011). Pabrik kurkumin yang dirancang memiliki kapasitas 60 ton/tahun dengan kemurnian 96%. Bahan baku yang digunakan yaitu serbuk kunyit sebanyak 3512,88 ton/tahun, solven etil asetat 1774,1818 kg/jam, petroleum ether 2319,7634 kg/jam, dan isopropil alkohol sebesar 31,0580 kg/jam.

Secara umum, tahapan pembuatan serbuk kurkumin terbagi menjadi beberapa tahapan utama. Tahapan awal adalah ekstraksi serbuk kunyit dengan kandungan awal kurkumin 3,42% menggunakan solven etil asetat. Hasil ekstraksi kurkuminoid masih mengandung minyak atsiri, sehingga perlu dipisahkan dengan proses *defatting* dengan menggunakan petroleum eter. Selanjutnya, dilakukan pemisahan senyawa kurkumin dari demetoksi-kurkumin dan bisdemetoksi-kurkumin dengan mencampurkan ekstrak kurkuminoid dengan isopropil alkohol, sehingga terbentuk padatan kurkumin dan selanjutnya dilakukan pengeringan. Total persentase *yield* kurkumin yang didapat sebesar 1,7%.

Pabrik produksi kurkumin direncanakan untuk didirikan di Kawasan Industri Wongsorejo, tepatnya di Krajan II, Alasbulu, Kecamatan Wongsorejo, Kabupaten Banyuwangi, Jawa Timur, dengan luas lahan 2 hektar. Pabrik ini diproyeksikan akan mulai beroperasi pada tahun 2031, dengan total investasi modal sebesar \$ 53.528.767,50 dan biaya produksi total mencapai \$ 34.397.470,42. Harga jual kurkumin ditetapkan sebesar \$ 204.210 per ton. Mengingat bahwa aplikasi industri ini masih relatif baru, pabrik ini tergolong berisiko rendah. Return on Investment (ROI) sebelum pajak tercatat sebesar 8,38% dan setelah pajak sebesar 11,17%. Periode pengembalian modal (POT) sebelum pajak diestimasikan selama 4,16 tahun dan setelah pajak selama 4,71 tahun. Nilai Discounted Cash Flow Rate of Return (DCFRR) diperkirakan sebesar 20,67%, dengan Break-even Point (BEP) sebesar 67,51% dan Shutdown Point (SDP) sebesar 22,55%. Berdasarkan parameter-parameter tersebut, pabrik kurkumin dianggap layak untuk dioperasikan dan menarik untuk diteliti lebih lanjut.

Kata kunci : kurkumin, kunyit, ekstraksi, industri, kurkuminoid

ABSTRACT

Based on data obtained from the Badan Pusat Statistik, the production of turmeric plants in 2021 was 184,825 tons and increased by 6.32% in 2022, reaching 196,499 tons. Turmeric has several components, one of which is curcumin, which can act as an anticancer, anti-inflammatory, antioxidant, and even anti-infective agent (Wilken, Veena, Wang, & Srivatsan, 2011). The designed curcumin plant has a capacity of 60 tons/year with a purity of 96%. The raw materials used are turmeric powder at 3512.88 tons/year, ethyl acetate solvent at 1774.1818 kg/hour, petroleum ether at 2319.7634 kg/hour, and isopropyl alcohol at 31.0580 kg/hour.

In general, the stages of producing curcumin powder are divided into several main stages. The initial stage is the extraction of turmeric powder with an initial curcumin content of 3.42% using ethyl acetate solvent. The curcuminoid extraction results still contain essential oils, which need to be separated by a defatting process using petroleum ether. Furthermore, the separation of curcumin compounds from demethoxy-curcumin and bisdemethoxy-curcumin is carried out by mixing the curcuminoid extract with isopropyl alcohol, forming curcumin solids which are then dried. The total percentage yield of curcumin obtained is 1.7%.

The curcumin production plant is planned to be established in the Wongsorejo Industrial Estate, precisely in Krajan II, Alasbulu, Wongsorejo District, Banyuwangi Regency, East Java, with a land area of 2 hectares. The plant is projected to start operations in 2031, with a total capital investment of \$53,528,767.50 and total production costs reaching \$34,397,470.42. The selling price of curcumin is set at \$204,210 per ton. Given that this industrial application is still relatively new, this plant is classified as low risk. Return on Investment (ROI) before tax is recorded at 8.38% and after tax at 11.17%. The pre-tax payback period (POT) is estimated at 4.16 years and after tax at 4.71 years. The Discounted Cash Flow Rate of Return (DCFRR) is estimated at 20.67%, with a Break-even Point (BEP) of 67.51% and a Shutdown Point (SDP) of 22.55%. Based on these parameters, the curcumin plant is considered feasible to operate and is of interest for further research.

Keywords: *curcumin, turmeric, extraction, industry, curcuminoids*