

INTISARI

Produksi hasil perikanan saat ini terus meningkat baik ikan hasil tangkap maupun pengolahan produk perikanan. Peningkatan produksi olahan ikan di ikuti oleh peningkatan limbah yang dihasilkan, bahkan bisa mencapai 30-40% dari total produksi. Limbah tersebut secara umum terdiri dari kepala, tulang, kulit, isi perut dan sisa daging. Akumulasi limbah organik tersebut bisa menjadi masalah serius jika tidak ditangani dengan baik. Padahal kandungan nutrisi dalam limbah tersebut masih tinggi, terutama kandungan proteinnya.

Proses biokonversi bahan organik dari limbah tersebut diharapkan mampu mengatasi permasalahan limbah industri perikanan dan meningkatkan nilai tambahnya. Biokonversi menggunakan larva serangga *Hermetia illucens* atau *black soldier fly (BSF)* memiliki banyak keunggulan dibandingkan proses konversi lainnya. Tujuan penelitian ini adalah untuk mengetahui kemampuan larva BSF dalam mengkonversi limbah pengolahan industri perikanan menjadi bahan pakan ikan.

Jenis limbah yang digunakan pada penelitian ini berupa kepala dan jeroan ikan Tuna dengan variasi jumlah pemberian pakan pada larva BSF sebesar 60, 80 dan 100 (mg/larva/hari). Larva yang digunakan sebanyak 200 ekor pada tiap perlakuan dengan 3 ulangan. Masa observasi dan pemeliharaan Larva BSF selama 19 hari kemudian di amati *substrate reduction*, *waste reduction index (WRI)*, *efficiency of conversion of digested-feed (ECD)*, bobot larva serta komposisi protein lemaknya, juga di analisa kelayakan usaha dari produksi pengolahan larva *Hermetia illucens* menjadi bahan baku pakan ikan.

Hasil pengamatan menunjukkan bahwa Larva *Hermetia illucens* tumbuh optimum dengan pemberian pakan berupa kepala ikan dengan *feeding rate* 60 mg/larva/hari. Dalam masa pemeliharaan 19 hari diperoleh bobot rata-rata sebesar 72.59 mg, *substrate consumption* 77.09 %, *waste reduction index* 4.06 % per hari, *efficiency of conversion of digested-feed* 8.32 % dan *survival rate* 98.33 %. Komposisi kimia larva (dalam berat basah) pada akhir masa pemeliharaan adalah protein 25.38 %, lemak 6.85 % dan air 62.81 %. Produksi larva *Hermetia illucens* menjadi bahan pakan ternak (*larvae meal*) untuk kapasitas produksi 1 ton per hari membutuhkan investasi sebesar Rp 425,997,500,- biaya operasional per tahun Rp 827,807,352,- dan hasil penjualan senilai Rp 1,007,760,000,-. Indikator kelayakan usaha menunjukkan B/C rasio 1.22, nilai *net present value* Rp 470,615,191,- *internal rate of return* 18%, *return of investment* 27.41 %, *payback periods* 3.6 tahun, *pay out time* 2.7 tahun dan *break event point* 69.95% atau 99.30 ton produk.

Kata kunci : Larva *Hermetia illucens*, maggot, black soldier fly, jeroan tuna, kepala tuna, bahan pakan ikan

ABSTRACT

The increase of fishery products in Indonesia is continue of both captured fish and processed fishery products due to government regulation on fishery management. The increase of fishery product results more waste generated of about 30-40% of total production. The waste generally consists of head, bone, skin, viscera and meat residues. The accumulation of organic waste can be a serious problem if not handled properly. Whereas the content of nutrients in the waste is still high, especially content of protein.

The bioconversion process of organic material from the waste was expected to overcome the problems of the fish processing industry waste and increase value added. Bioconversion using insect larvae of *Hermetia illucens* or black soldier fly (BSF) has many advantages than other conversion processes. The objective of this study was to determine the ability of BSF larvae in converting the fish processing industry waste into fish feed ingredients.

Types of waste used in this study were head and viscera tuna fish. Each treatment (three replicates per treatment) contained 200 larvae (6 days old) fed with three different daily food rates: 60, 80 and 100 mg / larva / day. Larvae reared during 19 days, moreover paramaters obeserved i.e. substrate reduction, waste reduction index (WRI), efficiency of conversion of digested-feed (ECD), larva biomass, protein and lipids content in biomass. Also analyzed the feasibility of the production of larvae *Hermetia illucens* processing into raw materials for fish feed.

The results of analyzed showed that larvae fed (60 mg / larva / day) on head of fish grow optimally. After rearing 19 days, the mean body weight of larva reached 72.59 mg, substrate consumption 77.09 %, waste reduction index 4.06 % per day, efficiency of conversion of digested-feed 8.32 % and survival rate 98.33 %. The chemical composition of larvae at the end rearing periods were protein 25.38%, lipid 6.85% and moisture 62.81%.

Production of larvae of *Hermetia illucens* into animal feed ingredients (larvae meal) requires an investment of Rp 425,997,500,- for production capacity of 1 ton per day, operational cost Rp 827,807,352,- per year and then total sales was Rp 1,007,760,000. Feasibility indicators showed B/C ratio 1.22, net present value Rp 470,615,191,- internal rate of return 18%, return of investment 27.41 %, payback periods 3.6 year, pay out time 2.7 year and break event point 69.95% or 99.30 ton product. Production economy is sensitive to raw materials price, capacity production and product price.

Keywords: *Hermetia illucens* larva, maggot, black soldier fly, viscera of tuna fish, head of tuna fish, feed fish ingredient