Jurnal Ilmu Pertanian Indonesia, April 2009, hlm. 50-64 Vol. 14 No.1
ISSN 0853 – 4217

OPTIMASI DAN PEMODELAN PROSES RECOVER FLAVOR DARI LIMBAH CAIR INDUSTRI PENGOLAHAN RAJUNGAN DENGAN *REVERSE OSMOSIS*

(OPTIMIZING AND MODELING OF RECOVERY FLAVOR FROM EFFLUENT CRAB PROCESSING BY *REVERSE OSMOSIS*)

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ABSTRACT

The waste water of blue crab pasteurization has potential in environmental pollution. It contained TSS of 206.5mg.l^{-1}, BOD 7,092.6mg.l^{-1} and COD of 51,000mg.l^{-1}. on the other hand, it also contains an interesting flavor compound, which composed of 0.23% non protein nitrogen and 17 amino acids where the highest was glutamic acid one. In this study, pre-filtration step using filter size 0.3 µ followed by reverse osmosis has been used to reduce these pollutions load and flavor compound recovery. During pre-filtration steps, TSS was reduced to 74.8% so turbidity decrased reased until 31%. After reverse osmosis process, BOD, and COD decreased more than 99%, and there was no amino acids detected in permeate stream. Factors that affect performance of reverse osmosis were transmembrane pressure, temperature and pH. The higher transmembrane pressure, temperature and pH resulted the higher the flux permeate. The use of higher temperature make flux increasing, eventually increasing transmembrane pressure make the flux increased only at transmembrane pressure less than 716 kPa. The protein rejection was influenced unsignifanctly by transmembrane pressure, temperature and pH. During concentrating flux declined exponentially by time function. At concentration factor 2.75 resulted 79% and 12% of increasing protein and NPN, respectively. The amino acids content can be increased 2−23 times of the origin. Even arginin and sistin, the amino acids that were undetectable initially, but they can bedetected at concentration of 0.0360 and 0.0250 (w/v) respectively at the end of the process. Hidrolysis and fermentation process can increase the amino acid content 31−45 times.

Keywords : Blue crab, flavor, recovery, reverse osmosis.

ABSTRAK

Air sisa pasteurisasi rajungan berpotensi mencemari lingkungan. Kadar TSS, BOD dan COD masing masing 206,5; 7.092,9; dan 51.000mg.l^{-1}. Namun demikian air sisa pasteurisasi tersebut juga mengandung komponen flavor yaitu 0,23% non protein nitrogen dan 17 asam amino dengan asam glutamat merupakan komponen tertinggi. Melalui filtrasi dengan filter 0,3 µ TSS dapat direduksi sampai 74,8% sehingga kekeruhanny berkurang sampai 31%. Setelah proses *reverse osmosis,* kadar BOD dan COD berkurang lebih dari 99% dan asam amino tidak terdeteksi lagi pada sisi permeat. Faktor parameter proses yang berpengaruh pada proses *reverse osmosis* meliputi tekanan *transmembran,* suhu dan pH. Semakin tinggi penggunaan suhu maka *fluks permeat* akan semakin meningkat, kenaikan tekanan *transmembran* hanya dapat meningkatkan *fluks* hanya pada tekanan kurang dari 716 kPa. Sementara itu nilai rejeksi protein selama *recovery* tidak signifikan dipengaruhi oleh parameter operasi tekanan *transmembran,* suhu dan pH. Selama pemekatan berlangsung *fluks* mengalami penurun secara eksponensial. Pada faktor konsentrasi 2,75 dihasilkan konsentrat protein 79% dan NPN 12%. Kadar asam-asam amino bahan dapat ditingkatkan 2−23 kali dari kadar semula, bahkan asam amino arginin dan sistin yang awalnya tidak terdeteksi pada akhir proses pengkonsentratan terdeteksi masing-masing dengan kadar 0,0360 dan 0,0250% (b/v). Proses hidrolisis dan fermentasi dapat meningkatkan kadar asam amino 31−45 kali.

Kata kunci : *Flavor*, rajungan, *recovery*, *reverse osmosis.*

PENDAHULUAN

Pemanfaatan *limbah* industri pengolahan rajungan selama ini hanya terbatas pada cangkang atau karapas sebagai bahan baku industri pakan dan chitin-chitosan, *limbah* berupa cairan selama ini

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