



Intisari

Pendugaan Umur Simpan Asam Lemak Makroalga *Ulva lactuca* Dengan Metode *Accelerated Shelf Life Testing*

Ulva lactuca adalah salah satu jenis makroalga hijau yang memiliki kandungan asam lemak tak jenuh cukup tinggi. Asam lemak tak jenuh mudah mengalami kerusakan akibat reaksi oksidasi. Penelitian ini bertujuan untuk mengetahui umur simpan asam lemak makroalga *U. lactuca* dengan metode *Accelerated Shelf Life Testing* (ASLT). Penyimpanan asam lemak *U. lactuca* dilakukan pada suhu penyimpanan $30\pm 2^\circ\text{C}$, $40\pm 2^\circ\text{C}$, dan $50\pm 2^\circ\text{C}$ berturut-turut selama 25, 20, dan 15 hari dengan interval pengujian setiap 5 hari sekali, 4 hari sekali dan 3 hari sekali. Parameter uji yang digunakan adalah angka peroksida, angka anisidin, dan total oksidasi. Hasil penelitian menunjukkan bahwa angka peroksida asam lemak *U. lactuca* yang disimpan pada suhu $30\pm 2^\circ\text{C}$ sebesar 1,52-9,24 mEq/kg, pada suhu $40\pm 2^\circ\text{C}$ sebesar 2,44-9,56 mEq/kg, sedangkan pada suhu $50\pm 2^\circ\text{C}$ sebesar 2,13-6,79 mEq/kg. Angka anisidin asam lemak *Ulva lactuca* yang disimpan pada suhu $30\pm 2^\circ\text{C}$, $40\pm 2^\circ\text{C}$, maupun $50\pm 2^\circ\text{C}$ cukup fluktuatif, sementara total oksidasi pada suhu $30\pm 2^\circ\text{C}$, $40\pm 2^\circ\text{C}$, dan $50\pm 2^\circ\text{C}$ berturut-turut sebesar 7,81-31,39, 12,48-26,86, dan 13,76-32,79. Dalam pengujian ASLT, parameter yang digunakan adalah angka peroksida dengan orde reaksi 0, karena mempunyai nilai R^2 mendekati 1. Berdasarkan perhitungan ASLT, diperoleh umur simpan asam lemak *U. lactuca* pada suhu penyimpanan $30\pm 2^\circ\text{C}$, $40\pm 2^\circ\text{C}$, dan $50\pm 2^\circ\text{C}$ berturut-turut adalah 8,93 hari, 9,26 hari, dan 6,04 hari. Pendugaan umur simpan asam lemak *U. lactuca* dapat dilakukan dengan parameter kritis angka peroksida menggunakan model pendekatan Arrhenius dengan persamaan $t = \frac{C_t - C_0}{1,127 \left(-\frac{88,499}{T} \right)}$.

Kata kunci : *Ulva lactuca*, asam lemak, umur simpan, oksidasi, ASLT



Abstract

Shelf Life Estimating of *Ulva lactuca* Macroalgae Fatty Acid With Accelerated Shelf Life Testing Method

Ulva lactuca is a type of green macroalgae that has high content of unsaturated fatty acids. Unsaturated fatty acids are easily damaged by oxidation reactions. This study aims to determine the shelf life of *Ulva lactuca* macroalgae fatty acids using the Accelerated Shelf Life Testing (ASLT) method. Storage of *U. lactuca* fatty acids was carried out at a storage temperature of $30 \pm 2^\circ\text{C}$, $40 \pm 2^\circ\text{C}$, and $50 \pm 2^\circ\text{C}$ with 25, 20 and 15 days, with testing intervals were every 5 days, 4 days and 3 days, respectively. The test parameters used are peroxide value, anisidin number, and total oxidation. The results showed that the number of *U. lactuca* fatty acid peroxide stored at $30 \pm 2^\circ\text{C}$ was 1.52-9.24 mEq / kg, at $40 \pm 2^\circ\text{C}$ was 2.44-9.56 mEq / kg, while at $50 \pm 2^\circ\text{C}$ was 2.13-6.79 mEq / kg. The anisidine value of *U. lactuca* fatty acids stored at $30 \pm 2^\circ\text{C}$, $40 \pm 2^\circ\text{C}$, and $50 \pm 2^\circ\text{C}$ had fluctuating values, while total oxidation at temperatures of $30 \pm 2^\circ\text{C}$, $40 \pm 2^\circ\text{C}$, and $50 \pm 2^\circ\text{C}$ were 7.81-31.39, 12.48-26.86 and 13.76-32.79, respectively. The parameter used in ASLT testing was the peroxide number with reaction order 0, because it had a value of R^2 close to 1. Based on ASLT calculations, the shelf life of *Ulva lactuca* fatty acids was obtained at a storage temperature of $30 \pm 2^\circ\text{C}$, $40 \pm 2^\circ\text{C}$, and $50 \pm 2^\circ\text{C}$ were 8.93 days, 9.26 days, and 6.04 days, respectively. Estimation of shelf life of *U. lactuca* fatty acids could be done with critical number parameters using the Arrhenius approved model with the equation $t = \frac{C_t - C_0}{1,127^{(-\frac{88,499}{T})}}$.

Keywords : *Ulva lactuca*, fatty acids, shelf life, oxidation, ASLT