RINGKASAN

Gula kelapa menjadi salah satu sumber gula yang diproduksi dalam berbagai bentuk seperti cetak, kristal, maupun cair. Gula kelapa cair memiliki potensi sebagai pemanis alami yang mudah untuk dikonsumsi. Namun, gula dapat mengalami kerusakan apabila tidak disimpan dengan baik. Kerusakan tersebut dapat berupa terbentuknya kristal gula akibat kristalisasi sukrosa dan tumbuhnya *yeast* atau kapang selama penyimpanan. Salah satu cara untuk mencegah kristalisasi adalah dengan menambahkan pengawet alami. Penambahan pengawet alami ekstrak kulit buah manggis diharapkan dapat mempertahankan mutu gula kelapa cair selama penyimpanan dan dapat memperpanjang umur simpan produk. Penelitian ini bertujuan untuk mengetahui perubahan nilai pH dan sukrosa gula kelapa cair dengan penambahan pengawet alami selama penyimpanan serta menduga umur simpan gula kelapa cair dengan penambahan pengawet alami menggunakan metode *Accelerated Shelf-Life Testing* (ASLT) model Arrhenius.

Penelitian difokuskan pada pendugaan umur simpan gula kelapa cair dengan metode *Accelerated Shelf-Life Testing* (ASLT) model Arrhenius. Suhu penyimpanan yang dipakai adalah 30, 40, dan 50°C dan waktu penyimpanan selama 28 hari dengan interval pengamatan 7 hari (0, 7, 14, 21, 28). Total unit yang diamati adalah 6 unit yang terdiri dari perlakuan penambahan pengawet alami konsentrasi 0% dan 0,3% yang disimpan dalam berbagai suhu. Variabel yang diamati meliputi fisik (warna), kimia dan sensori. Variabel kimia sebagai parameter kritis pendugaan umur simpan adalah kadar sukrosa, sementara untuk parameter pendukung meliputi pH, kadar gula total, gula reduksi, total padatan terlarut (Brix), aktivitas air (a_w), kadar air, dan kadar abu. Variabel sensori meliputi warna, aroma khas gula, tekstur, rasa, dan kesukaan.

Hasil penelitian menunjukkan bahwa perubahan nilai pH dan kadar sukrosa gula kelapa cair dengan dan tanpa penambahan pengawet alami 0,3% tidak berbeda selama penyimpanan 28 hari pada suhu yang berbeda (30, 40, dan 50°C). Rentang nilai pH dan kadar sukrosa gula kelapa cair tanpa penambahan pengawet alami adalah 5,13 – 5,36 dan 22,97 – 24,14%. Sementara rentang nilai pH dan kadar sukrosa gula kelapa cair dengan penambahan pengawet alami adalah 5,12 – 5,35 dan 23,05 – 24,13%. Hasil pendugaan umur simpan gula kelapa cair tanpa penambahan pengawet alami 0,3% yang disimpan pada suhu 30, 40, dan 50°C yaitu 29, 27, dan 27 hari, sedangkan umur simpan gula kelapa cair dengan penambahan pengawet alami lebih lama dibandingkan tanpa pengawet yaitu 30, 29, dan 29 hari.

Kata kunci: gula kelapa cair, pengawet alami, umur simpan, ASLT Arrhenius

SUMMARY

Coconut sugar is one of the sources of sugar and can be produced in various forms including printed, crystal, and liquid. Liquid coconut sugar has the potential to be a natural sweetener because of its ease of consumption. However, sugar can also be spoiled if is not stored properly. This spoil can include the formation of sugar crystals due to sucrose crystallization and the growth of yeast or mold during storage. One way to prevent crystallization is to add natural preservatives. The addition of natural preservative mangosteen peel extract is expected to maintain the quality of liquid coconut sugar during storage and extend the shelf life of the product. This study aims to determine the changes in the pH value and sucrose of the liquid coconut sugar with addition of natural preservatives during storage and knowing the estimation of the shelf life of liquid coconut sugar with addition of natural preservative using Accelerated Shelf-Life Testing (ASLT) method.

The research focused on estimating the shelf life of liquid coconut sugar used in this study was Accelerated Shelf-Life Testing (ASLT) with the Arrhenius model. The storage temperature used were 30, 40, and 50°C. Furthermore, the duration of storage was 28 days with observation intervals of 7 days (0, 7, 14, 21, and 28 days). The total units observed were 6 units consisting of treatments with the addition of natural preservatives with concentrations of 0% and 0,3% which were stored at various temperatures. The variable observed in the study include physical (color), chemical properties, and sensory properties. Chemical properties as critical parameters observed to estimate the shelf life of liquid coconut sugar were sucrose content. Chemical variables as supporting parameters include total sugar, reduction sugar, total dissolved solids (brix), water activity (a_w), moisture content, and ash content. Sensory variables include color, aroma, texture, flavor, and preference.

The results showed that the changes in the pH value and sucrose content of liquid coconut sugar with and without addition of natural preservative 0,3% were not different during 28 days of storage at different temperatures (30, 40, and 50°C). The range of pH value and sucrose content of liquid coconut sugar without the addition of natural preservative was 5,13 – 5,36 and 22,97 – 24,14%. Meanwhile, the range of pH value and sucrose content of liquid coconut sugar with the addition of natural preservative was 5,12 – 5,35 and 23,05 – 24,13%. The estimated shelf life of liquid coconut sugar without the addition of natural preservatives 0,3% stored at 30, 40, and 50°C were 29, 27, and 27 days. Meanwhile, the estimated shelf life of liquid coconut sugar with the addition of natural preservatives were 30, 29, and 29 days.

Keywords: liquid coconut sugar, natural preservatives, shelf life, ASLT Arrhenius