

RINGKASAN

Sektor pangan terus berkembang memformulasikan beragam produk pangan fungsional, salah satunya adalah susu nabati sebagai pengganti susu hewani. Pengembangan susu nabati dilakukan dengan memanfaatkan jagung manis karena memiliki kandungan gizi yang baik serta ketersediaannya yang melimpah. Susu jagung manis rentan terhadap kontaminasi dan perubahan selama penyimpanan karena tingginya kandungan air berkisar 70-80%. Alternatif untuk memperpanjang umur simpan susu jagung yaitu dengan pengeringan menjadi susu bubuk. *Foam mat drying* dipilih sebagai metode pengeringan dengan menggunakan bahan pembusa berupa putih telur dan karagenan sebagai bahan penstabil dan pengental. Penelitian ini bertujuan untuk mempelajari aplikasi metode *foam-mat drying* pada proses pengeringan susu jagung manis serta mengetahui pengaruhnya terhadap karakteristik fisik dan kimianya.

Penelitian ini menggunakan Rancangan Acak Lengkap (RAL) dengan 2 faktor yaitu konsentrasi putih telur (O) : (10%, 15%) dan rasio karagenan (K) : (kappa-/iota-karagenan 0:1, kappa-/iota-karagenan 1:0, kappa-/iota-karagenan 1:1). Susu jagung dibuat dengan menghaluskan biji jagung manis yang telah direbus kemudian disaring. Filtrat yang diperoleh selanjutnya dipasteurisasi pada suhu 80°C selama 15 menit. Susu jagung terpasteurisasi kemudian dicampur dengan kappa-/iota karagenan pada suhu 70°C. Dilakukan pengocokan putih telur dan maltodekstrin selama 7 menit sehingga menghasilkan busa yang mengembang. Selanjutnya busa dan susu jagung dicampur kemudian ditempatkan pada loyang dan dikeringkan pada suhu 60°C selama 6 jam. Sampel yang kering, diblender sehingga dihasilkan susu jagung bubuk. Analisa yang dilakukan meliputi stabilitas busa, rendemen, kadar air, kadar protein kasar, kadar lemak, kadar abu, higroskopisitas, densitas nyata, densitas kamba, indeks kelarutan, pH, Aw dan warna. Data yang diperoleh dianalisa menggunakan ANOVA, dan jika terdapat pengaruh yang nyata akan diuji lanjut menggunakan uji DMRT, serta untuk penentuan perlakuan terbaik dengan metode indeks efektivitas De Garmo.

Hasil penelitian menunjukkan interaksi penambahan putih telur dan jenis karagenan hanya berpengaruh nyata terhadap nilai stabilitas susu jagung. Variasi konsentrasi putih telur berpengaruh nyata terhadap kadar protein, kadar air, karbohidrat dan densitas susu jagung bubuk. Sedangkan, jenis karagenan berpengaruh nyata terhadap kadar air susu jagung bubuk. Hasil terbaik dihasilkan oleh susu jagung bubuk dengan perlakuan penambahan putih telur 15% dan kappa-/iota-karagenan 1:1 dengan karakteristik sebagai berikut, stabilitas busa 96,50%, rendemen 24,60%, kadar air 3,66%, kadar protein kasar 18,73%, kadar abu 1,70%, kadar lemak kasar 2,22%, densitas kamba 0,59g/ml dan densitas nyata 0,68g/ml, higroskopisitas 4,55%, indeks kelarutan 60,64%, pH 7,23, aktivitas air 0,35, warna nilai L* 80,06, nilai a* -3,05, nilai b* 36,14.

Kata kunci : *Foam mat drying*, karagenan, jagung manis, putih telur, susu bubuk

SUMMARY

The food industry sector continues to develop to formulate a variety of functional food products, one of which is plant-based milk as a substitute for animal milk. The development of plant-based milk is done by utilizing sweet corn because it has good nutritional content and abundant availability. Sweet corn milk is susceptible to contamination and changes during storage due to its high water content ranging from 70-80%. An alternative to extend the shelf life of corn milk is drying it into milk powder. Foam mat drying was chosen as the drying method using egg white as the foaming agent and carrageenan as the stabilizer and thickener. This research aims to study the application of the foam-mat drying method in the drying process of sweet corn milk and determine its effect on its physical and chemical characteristics.

This study used a completely randomized design (CRD) with 2 factors, egg white concentration (O): (10%, 15%) and carrageenan ratio (K): (kappa-/iota-carrageenan 0:1, kappa-/iota-carrageenan 1:0, kappa-/iota-carrageenan 1:1). Corn milk was made by mashing sweet corn kernels that had been boiled and then filtered. The filtrate obtained was then pasteurized at 80°C for 15 minutes. Pasteurized corn milk was then mixed with kappa-/iota carrageenan at 70°C. Egg whites and maltodextrin were shaken for 7 minutes to produce a foam. The foam and corn milk were then mixed, placed on a baking sheet and dried at 60°C for 6 hours. The dried samples were blended to produce corn milk powder. The analysis included foam stability, yield, moisture content, crude protein content, fat content, ash content, hygroscopicity, tapped density, bulk density, solubility index, pH, Aw and color. The data obtained were analyzed using ANOVA, and if there was a significant effect, it would be further tested using the DMRT test, and to determine the best treatment using the De Garmo effectiveness index method.

The results showed that the interaction of egg white addition and carrageenan type only significantly affected the stability value of corn milk. Variation of egg white concentration significantly influenced the protein content, moisture content, carbohydrate and density of corn milk powder. Meanwhile, the type of carrageenan significantly affects the water content of corn milk powder. The best results were produced by corn milk powder with 15% egg white addition and kappa-/iota-carrageenan 1:1 with the following characteristics, foam stability 96.50%, yield 24.60%, moisture content 3.66%, crude protein content 18.73%, ash content 1.70%, crude fat content 2.22%, bulk density 0.59g/ml and tapped density 0.68g/ml, hygroscopicity 4.55%, solubility index 60.64%, pH 7.23, water activity 0.35, color L value 80.06, a* value -3.05, b* value 36.14.*

Keywords: *Foam mat drying, carrageenan, sweet corn, egg white, milk powder*