RINGKASAN

Kesadaran masyarakat yang meningkat terhadap pentingnya kesehatan mendorong perubahan pola konsumsi pangan ke arah pangan fungsional. Yoghurt, sebagai salah satu pangan fungsional kini tidak hanya dibuat dari susu hewani, tetapi juga dari susu nabati seperti susu jagung yang bebas laktosa, tinggi serat, dan harganya lebih murah. Namun, yoghurt dari susu jagung memiliki kadar protein rendah. Fortifikasi dengan spirulina dan isolat protein kedelai terbukti efektif meningkatkan kadar protein hingga memenuhi standar SNI 2981:2009 yaitu minimal 2,7%. Yoghurt memiliki umur simpan pendek, sehingga pengolahan menjadi yoghurt bubuk melalui metode *foam-mat drying* menjadi solusi untuk memperpanjang masa simpan tanpa mengorbankan kualitas produk. Metode ini memerlukan penggunaan agen pembusa dan penstabil. *Whey Protein Concentrate* (WPC) digunakan sebagai agen pembusa dan Gliserol Monostearat (GMS) sebagai penstabil busa. Keduanya diketahui dapat memengaruhi struktur busa, efisiensi pengeringan, dan mutu produk akhir, namun belum ada penelitian yang mengkombinasikan WPC dan GMS dalam pembuatan yoghurt bubuk. Tujuan penelitian adalah menentukan konsentrasi optimal *foaming agent* GMS dan WPC pada pembuatan yoghurt bubuk susu jagung, dan mengkaji karakteristik fisikokimia dan sensori yoghurt bubuk susu jagung pada perlakuan optimum.

Metode penelitian ini menggunakan optimasi *Simplex Lattice Design* pada *software Design Expert v.13.* Faktor yang diteliti adalah konsentrasi GMS dan WPC dengan respon yang diteliti adalah rendemen, kelarutan, dan kadar protein. Variabel uji karakterisasi meliputi rendemen, kelarutan kadar air, kadar abu, kadar lemak, kadar protein, karbohidrat, vitamin C, antioksidan, beta-karoten, total bakteri asam laktat (BAL), dan sensori. Hasil pengujian respon dianalisis menggunakan *Design Expert v.13*.

Hasil penelitian menunjukkan bahwa konsentrasi GMS dan WPC berpengaruh nyata terhadap rendemen, kelarutan, dan kadar protein yoghurt bubuk. Penambahan GMS 1% dan WPC 10% menghasilkan kondisi optimum dengan kadar rendemen sebesar 34,08±0,24%, kelarutan 52,33±0,81%, kadar air 9,8±0,07%, kadar lemak 6,93±0,07%, kadar abu 2,3±0%, kadar protein 27,31±0,41%, karbohidrat 53,48±0,08%, vitamin C 5,28±0 mg/100g, beta-karoten 26,34±0,7 µg/100g, BAL 5,50 x 10^2 CFU/g, dan antioksidan 2192,250 ppm. Yoghurt bubuk memiliki warna kuning kehijauan, rasa sedikit asam, flavor jagung sedikit tidak kuat, beany flavor kuat, tekstur sedikit tidak kental dan tingkat kesukaan secara keseluruhan (*overall*) sedikit tidak suka.

SUMMARY

Increased public awareness of the importance of health is driving a shift in food consumption patterns toward functional foods. Yogurt, as one of these functional foods, is now not only made from animal milk but also from plant-based milk such as lactose-free corn milk, which is high in fiber and more affordable. However, yogurt made from corn milk has a low protein content. Fortification with spirulina and soy protein isolate has proven effective in increasing protein content to meet the SNI 2981:2009 standard of at least 2.7%. Yogurt has a short shelf life, so processing it into powdered yogurt using the foam-mat drying method is a solution to extend shelf life without compromising product quality. This method requires the use of foaming agents and stabilizers. Whey Protein Concentrate (WPC) is used as the foaming agent, and Glycerol Monostearate (GMS) as the foam stabilizer. Both are known to influence foam structure, drying efficiency, and final product quality; however, no studies have combined WPC and GMS in the production of yogurt powder. The objective of this study was to determine the optimal concentration of GMS and WPC as foaming agents in the production of corn milk yogurt powder and to examine the physicochemical and sensory characteristics of corn milk yogurt powder under optimal conditions.

The research method used Simplex Lattice Design optimization in Design Expert v.13 software. The factors studied were GMS and WPC concentrations, with the responses studied being yield, solubility, and protein content. The characterization test variables included yield, solubility, moisture content, ash content, fat content, protein content, carbohydrates, vitamin C, antioxidants, beta-carotene, total lactic acid bacteria (LAB), and sensory properties. The response test results were analyzed using Design Expert v.13.

The results of the study indicate that the concentrations of GMS and WPC significantly affect the yield, solubility, and protein content of powdered yogurt. The addition of 1% GMS and 10% WPC resulted in optimal conditions with a yield of 34,08±0,24%, solubility of 52,33±0,81%, moisture content of 9,8±0,07%, fat content of 6,93±0,07%, ash content of 2,3±0%, protein content of 27,31±0,41%, carbohydrate content of 53,48±0.08%, vitamin C content of 5,28±0 mg/100g, beta-carotene content of 26,34±0,7 µg/100g, BAL of 5,50 x 10^2 CFU/g, and antioxidant content of 2192,250 ppm. The powdered yogurt has a yellowish-green color, a slightly sour taste, a mild corn flavor, a strong bean flavor, a slightly thin texture, and an overall preference rating of slightly disliked.