RINGKASAN

Masyarakat saat ini lebih menginginkan produk makanan sehat, memiliki umur simpan panjang, seperti makanan dengan kadar protein tinggi, tinggi antioksidan, memiliki kadar air rendah serta sifat fungsional lainnya. Aktivitas harian yang dilakukan menuntut tubuh bekerja secara maksimal sehingga kebutuhan protein hariannya harus tecukupi. Salah satu produk yang dapat diinovasikan sebagai produk instan dan fungsional adalah yoghurt bubuk susu jagung.

Yoghurt susu jagung merupakan produk fermentasi yang memiliki kadar air cukup tinggi, akan tetapi memiliki kadar protein yang rendah. Salah satu upaya untuk menghasilkan produk yang sehat bergizi serta umur simpan lama yaitu dengan meningkatkan kadar protein yoghurt susu jagung dengan metode fortifikasi spirulina dan isolat protein kedelai, serta membuat produk bubuk. Tujuan dari penelitian ini adalah 1) Mengetahui formulasi yoghurt susu jagung yang difortifikasi dengan spirulina dan isolat protein kedelai. 2) Mengetahui konsentrasi *tween* 80% sebagai *foaming-agent* yang tepat pada metode *foam-mat drying* yoghurt bubuk susu jagung.

Pada penelitian ini digunakan Rancangan Acak Lengkap (RAL) dengan faktor fortifikasi yaitu konsentrasi spirulina dan isolat protein kedelai pada taraf perlakuan 0,08%, 0,12%, dan 0,16% spirulina dan 4,5%, 8,5%, dan 12,5% isolat protein kedelai. Pada penelitian yoghurt bubuk yaitu faktor konsentrasi *foaming-agent* dengan taraf 0,75%, 1,25%, dan 1,75%. Variabel penelitian yang dilakukan yaitu uji karakteristik fisikokimia meliputi kadar air, kadar abu, kadar protein, kadar karbohidrat, uji pH, sineresis, viskositas, total padatan, kelarutan, aktivitas air, dan densitas kamba, analisis fungsional yang meliputi aktivitas antioksidan, betakaroten, serat pangan dan total bakteri asam laktat serta analisis sensori yang meliputi uji rasa, intensitas warna kuning, hijau, flavor jagung, *beany* flavor, spirulina flavor, kekentalan dan tingkat kesukaan keseluruhan (*overall*).

Hasil analisis perlakuan terbaik berdasarkan sifat fisikokimia dan sensori pada yoghurt fortifikasi tinggi protein dihasilkan sampel P2S2 konsentrasi spirulina 0,12% dan isolat protein 8,5% sebagai perlakuan terbaik dengan kadar protein 5,41%. Kemudian hasil analisis perlakuan terbaik yoghurt bubuk yaitu pada perlakuan konsentrasi *foaming-agent* sebesar 0,75% dengan karakteristik fisikokimia meliputi kadar air 10,52%, kadar abu 2,32%, kadar lemak 2,49%, kadar frotein 4,33%, kadar karbohidrat 77,74%, kadar gula reduksi 0,53%, nilai pH 3,62, kelarutan 70,72%, aktivitas air 0,56, densitas kamba 0,69 g/ml, total BAL 13,5 x 10^7 CFU/g, aktivitas antioksidan 69,56%, kadar betakaroten 91,45 µg/100g, serat pangan total 3,23%. sifat sensori yang meliputi parameter rasa dengan 3,92, warna hijau 2,38, warna kuning 2,48, flavor jagung 2,40, *beany* flavor 3,65, spirulina flavor 3,90, tekstur 3,08, serta nilai (*overall)* dengan skor 3,08.

Kata kunci: Yoghurt bubuk, spirulina, isolat protein kedelai, fortifikasi, *foam-mat drying*, tinggi protein, sifat fungsional

SUMMARY

Nowadays, people want healthy food products that have a long shelf life, such as foods with high protein content, high antioxidants, low water content and other functional properties. Daily activities require the body to work optimally so that daily protein needs must be met. One product that can be innovated as an instant and functional product is corn milk powdered yoghurt.

Corn milk yoghurt is a fermented product that has quite high water content, but low protein content. One effort to produce a healthy, nutritious and long-lasting product is by increasing the protein content of corn milk yoghurt using the fortification method of spirulina and soy protein isolate, as well as making a powdered product. The aim of this research 1) Determine the formulation of corn milk yogurt fortified with spirulina and soy protein isolate. 2) Knowing the right concentration of tween 80% as foaming-agent in the foam-mat drying method of yoghurt powder corn milk.

In this study, a Completely Randomized Design (CRD) was used with fortification factors, namely the concentration of spirulina and soy protein isolate at treatment levels of 0.08% , 0.12% and 0.16% spirulina and 4.5%, 8.5% and 12.5% soy protein isolate. In the research on powdered yoghurt, the foaming-agent concentration factor was at levels of 0,75%, 1,25%, and 1,75%. The research variabels carried out were physicochemical characteristic tests including water content, ash content, protein content, carbohydrate content, pH test, syneresis, viscosity, total solids, solubility, water activity and kamba density, functional analysis including antioxidant activity, beta-carotene, fiber food and total lactic acid bacteria as well as sensory analysis which includes taste tests, intensity of yellow, green color, corn flavor, beany flavor, spirulina flavor, viscosity and overall liking level (overall).

The results of the analysis of the best treatment based on the physicochemical and sensory properties of high protein fortified yoghurt produced a P2S2 sampel with a spirulina concentration of 0.12% and a protein isolat of 8.5% as the best treatment with a protein content of 5,41%. Then the results of the analysis of the best treatment for powdered yoghurt were the treatment with a foaming-agent concentration of 0,75% with physicochemical characteristics including water content 10.52%, ash content 2.32%, fat content 2.49%, protein content 4.33%, carbohydrate content 77.74%, reducy sugar 0.53%, pH value 3.62, solubility 70.72%, water activity 0.56, kamba density 0.69 g/ml, BAL content 13,5 x 10^7 CFU/g, antioxidant activity 69.56%, beta-carotene content 91.45 µg/100g, total dietary fiber 3.23%. Sensory properties include taste parameters with 3.92, green color 2.38, yellow color 2.48, corn flavor 2.40, beany flavor 3.65, spirulina flavor 3.90, texture 3.08, and overall value with a score of 3.08.

Key words: Yoghurt powder, spirulina, soy isolate protein, fortification, foam-mat drying, high protein, functional properties