LAPORAN AKHIR
Penelitian Unggulan Perguruan Tinggi (U)

JUDUL : **Peningkatan Agroindustri Susu Melalui Harmonisasi, Implementasi Good Farming Practices, Diversifikasi Produk dan Traceability di Kabupaten Probolinggo**

Tahun kedua dari rencana dua tahun

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PENINGKATAN AGROINDUSTRI SUSU MELALUI HARMONISASI IMPLEMENTASI GOOD FARMING PRACTICES, DIVERSIFIKASI PRODUK DAN TRACEABILITY DI KABUPATEN PROBOLINGGO

RINGKASAN

Penelitian dan penerapan teknologi dengan judul: "Peningkatan Agroindustri Susu Sapi Melalui Implementasi *Good Farming Practices* (GFP), diversifikasi produk, dan *traceability study* di Kabupaten Probolinggo". Pada penelitian tahun kedua: Tahap pertama tentang diversivikasi produk: **Mengkaji media adaftif lokasi sebagai induser produksi eksopolisakarida dan peptida aktif dalam yogurt sebagai bahan pembuatan es krim probiotik**. Yogurt dalam hal ini sebagai bahan baku pembuatan es krim probiotik, sedangkan nano teknologi pada pengolahan es krim adalah suatu teknologi meningkatkan kelembutan es krim sehingga dihasilkan es krim dengan kristal yang lembut. Eksopolisakarida hasil metabolit BAL berfungsi sebagai stabiliser dan c*ryoprotectan* kultur dalam proses pembekuan sehingga optimalisasi produk eksopolisakarida dapat meningkatkan viabilitas BAL.

Metode penelitian pada tahap ini adalah percobaan laboratorium. Desain penelitian RAL: Penambahan sari wortel (P1: 0, P2: 5. P3:, 10 dan P4:15%) sari wortel pada 10% whey protein.. Variabel yang diamati antara lain adalah organoleptik, kadar air, dan total padatan, nilai pH, total asam, total karoten, protein, viskositas, aktivitas enzim β-galaktosidase dan produksi eksopolisakarida dan viabilitas BAL, Analisis mikrostruktur dengan SEM (*Scaning Electron Microscop*) dan aktivitas fungsional sebagai antimikroba diuji aktivitas penghambatan terhadap mikroba uji *C. albicans*

Hasil penelitian menunjukkan penerimaan konsumen tertinggi pada penambahan ekstrak wortel 15%. Es krim dengan viskositas 245 cP, kecepatan meleleh 18,38 menit/50 g, kadar air paling tinggi 62,88 % dengan total padatan 37,11% menunjukkan karakteristik produk padat dan lembut dengan *overun* 37%. Penampakan yang menarik dengan pewarna alami dari sari wortel. Produk menunjukkan karakteristik produksi eksopolisakarida yang optimal yang menyumbangkan nilai kestabilan produk yang cukup baik, dengan tingkat kecepatan melelh 18,38 menit adalah kisaran waktu yang otimum dari segi penerimaan konsmen. Hasil SEM memperlihatkan rongga merata, kristal es yang lembut, viabilitas BAL tinggi, dan aktivitas antimikroba terhadap *C. albicans* serta aktivitas β-galaktosidase sebagai indikator produk yang menyehatkan.

Kata Kunci**:** Susu**,** yogurt, es krim probiotik, aktivitas β-galaktosidase

THE IMPROVEMENT OF MILK AGRO-INDUSTRY THROUGH HARMONIZATION OF GOOD FARMING PRACTICES IMPLEMANTATION, PRODUCTS DIVERSIFICATION AND TRACEABILITY IN PROBOLINGGO REGENCY

SUMMARY

Research and technology application with the title: "The improvement of Milk Agro-industry through harmonization of Good Farming Practices (GFP) Implementation, diversification of products, and traceability study in Probolinggo Regency". In the second year of the study: The first phase were product diversification: Assessing the adaptive media as an inducer exopolysaccharide production and active peptides in probiotic ice cream yogurt. Yogurt in this case as a raw material for making ice cream probiotics, while nano-technology in the processing of ice cream is a technology that increases the softness of the ice cream produced with a soft crystal. Exopolysaccharide as extracellular metabolite of LAB function as a stabilizer and cryoprotectan culture in the freezing process so that the optimization of exopolysaccharide products can improve the viability of LAB.

The experiment was designed by completely randomized design consist of four treatment (P1: 0, P2: 5. P3 and P4 :, 10: 15%) of carrot juice at 10% whey protein. The variables measured include organoleptic, moisture content, and solids matter, acidity, carotene, protein, viscosity, β-galactosidase enzyme activity, exopolysaccharide production and LAB viability, microstructure analysis by SEM (Scanning Electron microscop) and functional activity as tested antimicrobial inhibitory activity against *C. Albicans*.

The results showed the highest consumer acceptance were the ice cream with added 15% carrot juice by viscosity 245 cP, melting speed 18.38 minutes/50 g, water content 62.88%, solid matter 37.11% and overun 37%, attractive appearance with natural dyes from carrot juice, exopolysaccharide 48.03 mg/100g found the content to be ice cream stable. The soft microstructure by SEM showed soft ice crystals with high viability of probiotic LAB, antimicrobial activity againt *C. albicans* and of β-galactosidase activity as well as an indicator of a healthy product.

Key Words**:** Milk**,** yogurt, probiotic ice cream, β-galaktosidase activity

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