

## FERMENTASI MINUMAN *WHEY* DENGAN VARIASI PENAMBAHAN KONSENTRASI GULA MENGGUNAKAN KULTUR KOMERSIAL DITAMBAH PROBIOTIK LOKAL

### INTISARI

Oleh:

**ALBERTUS RYAN ANTHONY**

**21/476612/TP/13125**

*Whey* merupakan produk samping dari proses pembuatan keju yang masih memiliki kandungan nutrisi tinggi, tetapi dapat mencemari lingkungan jika tidak dikelola dengan baik. Salah satu cara memanfaatkan *whey* adalah dengan mengolahnya menjadi minuman fermentasi. Penelitian ini bertujuan untuk menganalisis pengaruh variasi penambahan konsentrasi gula terhadap pertumbuhan dan aktivitas bakteri asam laktat dan probiotik selama fermentasi serta stabilitas produk minuman fermentasi *whey* selama penyimpanan. Fermentasi dilakukan menggunakan kultur starter komersial yang ditambah dengan *Lactiplantibacillus plantarum* subsp. *plantarum* Dad-13 sebagai probiotik lokal dengan variasi penambahan konsentrasi gula sebesar 6%, 7%, dan 8%. Parameter yang diamati meliputi jumlah sel BAL dan probiotik selama fermentasi, pH, total asam tertitrasi, viskositas, dan viabilitas bakteri selama penyimpanan.

Hasil penelitian menunjukkan bahwa pada seluruh konsentrasi penambahan gula, proses fermentasi berjalan dengan baik dimana jumlah sel BAL sudah mencapai log 9 CFU/mL dan probiotik telah mencapai log 8 CFU/mL. Aktivitas sel BAL dan probiotik selama proses fermentasi berjalan baik yang ditunjukkan nilai pH yang mendekati 4,4. Selama penyimpanan 6 minggu jumlah sel BAL maupun probiotik masih berada di kisaran log 7 CFU/mL dan masih memenuhi standar pangan probiotik. Nilai pH masih berada dalam rentang 4,0-4,4 dan jumlah asam laktat berada pada rentang 0,85–0,99% sehingga masih memenuhi standar. Nilai viskositas berkisar antara 18,86–27,58cP dimana lebih tinggi dibandingkan produk komersial. Dengan demikian, minuman fermentasi *whey* dengan penambahan gula menggunakan kultur komersial ditambah probiotik lokal menghasilkan produk dengan karakteristik yang baik serta potensi sebagai minuman fungsional yang stabil selama penyimpanan.

Kata kunci: Bakteri asam laktat, *Lactiplantibacillus plantarum* subsp. *plantarum* Dad-13, minuman fermentasi, probiotik lokal, *Whey*.

## **FERMENTATION OF WHEY DRINK WITH VARIATIONS IN ADDING SUGAR CONCENTRATION USING COMMERCIAL CULTURES PLUS LOCAL PROBIOTICS**

### **ABSTRACT**

**By:**

**ALBERTUS RYAN ANTHONY**

**21/476612/TP/13125**

Whey is a by-product of the cheese-making process that still contains high nutritional value but can cause environmental pollution if not properly managed. One way to utilize whey is by processing it into a fermented beverage. This study aims to determine the effect of sugar addition at various concentrations on the growth and activity of lactic acid bacteria (LAB) and probiotics during fermentation, as well as the stability of the fermented whey beverage during storage. Fermentation was carried out using a commercial starter culture combined with *Lactiplantibacillus plantarum* subsp. *plantarum* Dad-13 as a local probiotic, with sugar concentration variations of 6%, 7%, and 8%. The observed parameters included LAB and probiotic cell counts during fermentation, pH, total titratable acidity, viscosity, and bacterial viability during storage.

The results showed that at all sugar concentration levels, the fermentation process proceeded well with LAB cell counts reaching log 9 CFU/mL and probiotic cell counts reaching log 8 CFU/mL. The activity of LAB cells and probiotics during the fermentation process went well as indicated by a pH value approaching 4.4. After 6 weeks of storage, the LAB and probiotic cell counts remained around log 7 CFU/mL, still meeting probiotic food standards. The pH values remained within the range of 4.0–4.4 and lactic acid content ranged from 0.85% to 0.99%, maintaining compliance with standard requirements. The viscosity values ranged from 18.86 to 27.58 cP, which was higher than commercial products. Thus, fermented whey beverage with sugar addition using a commercial starter combined with a local probiotic resulted in a product with good characteristics and potential as a stable functional beverage during storage.

**Keywords:** Lactic acid bacteria, *Lactiplantibacillus plantarum* subsp. *plantarum* Dad-13, fermented beverage, local probiotic, whey.