

**PEMBUATAN PERMEN COKELAT PROBIOTIK MENGGUNAKAN
KULTUR *Lactobacillus Plantarum* DAD-13 DENGAN BAHAN BAKU BIJI
KAKAO TERFERMENTASI SPONTAN DENGAN PENAMBAHAN
Lactobacillus Plantarum HL-15**

ABSTRAK

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Kakao (*Theobroma cacao* L.) merupakan komoditas perkebunan yang potensial. Produk olahan kakao memiliki sifat yang spesial dari pangan lainnya karena sifatnya yang tidak dimiliki oleh pangan lain yaitu bersifat padat di suhu ruang dan meleleh sempurna pada suhu tubuh. Namun, biji kakao Indonesia memiliki kualitas yang relatif rendah dibandingkan dengan negara lain. Hal ini bisa disebabkan karena kegagalan selama proses fermentasi yang memengaruhi aroma kakao. Kegagalan pada proses fermentasi tidak dapat diperbaiki pada proses selanjutnya. Proses fermentasi tradisional dapat dikendalikan salah satunya dengan penambahan starter bakteri asam laktat yang memproduksi metabolit senyawa antijamur. Penggabungan probiotik ke dalam cokelat dapat memberikan alternatif yang baik untuk produk yang memungkinkan untuk memperluas klaim kesehatan produk makanan berbasis cokelat. Tujuan penelitian ini adalah untuk mengetahui pengaruh penambahan starter *Lactobacillus plantarum* HL-15 yang memiliki aktivitas antijamur dan variasi suhu penyimpanan terhadap kualitas kimia, sensoris, dan mikrobiologis permen cokelat probiotik DAD-13.

Penambahan kultur starter *Lactobacillus plantarum* HL-15 selama proses fermentasi dapat menurunkan konsentrasi kontaminasi jamur dibandingkan dengan kontrol (tanpa penambahan starter). Namun, tidak mempengaruhi pH dan a_w biji kakao dan pH permen coklat. Variasi suhu penyimpanan tidak mempengaruhi pH dan a_w , cokelat namun penggunaan penyimpanan suhu kulkas (4°C) dapat mempertahankan kestabilan viabilitas probiotik DAD-13 dan meminimalkan kerusakan lemak (nilai peroksida). Atribut warna, kenampakan, aroma, rasa, dan tekstur tidak berbeda nyata ($p > 0,05$), namun atribut aftertaste berbeda nyata antar sampel ($p < 0,05$). Penyimpanan suhu dingin (4°C) memberikan aftertaste pahit lebih tinggi daripada penyimpanan suhu ruang (26°C)

Kata kunci: fermentasi kakao, suhu penyimpanan, cemaran jamur, bakteri asam laktat, probiotik

**THE DEVELOPMENT OF PROBIOTIC (*Lactobacillus Plantarum* DAD-13)
CHOCOLATE CANDY USING CACAO BEANS WHICH DIRECT
FERMENTED BY *Lactobacillus Plantarum* HL-15 AS RAW MATERIALS**

ABSTRACT

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Cocoa (*Theobroma cacao* L.) is a potential plantation commodity. Cocoa products have special properties from other foods such as exhibits a solid state at room temperature and perfectly melt at body temperature. However, Indonesia's cocoa beans has a relatively low quality compared to other countries. It could be due to the failure during the fermentation process that affect the beans flavor. The failure in the fermentation process can't be corrected on the next process. The traditional fermentation process can be controlled by adding a starter of lactic acid bacteria which produces metabolites of antifungal compounds. Probiotics provide many positive effects on human health. The good quality of cocoa beans will produce the good products. Meanwhile, the incorporation of probiotics during the chocolate candy making could enhance its functionality and provide a health claim of chocolate-based products. The purpose of this study is to determine the effect of the addition of starter *Lactobacillus plantarum* HL-15 which has antifungal activity and variations in storage temperature on the chemical, sensory, and microbiological qualities of probiotic chocolate candy DAD-13.

The addition of *Lactobacillus plantarum* HL-15 during fermentation process could lower the concentration of fungal contamination compared to control (without starter addition). It did not affect the pH and a_w of cocoa beans and the pH of the chocolate candy. Storage temperature variations did not affect pH and a_w of chocolate candy. While, storage at cold temperature (4°C) could maintain the viability of probiotic DAD-13 and minimize the fat damage (peroxide value). The color, appearance, aroma, taste, and texture attributes are not significantly different ($p > 0.05$), but aftertaste attributes were significantly different between samples ($p < 0.05$). Cold temperature storage (4°C) provides a higher bitter aftertaste than room temperature storage (26°C).

Keywords: fermented cocoa, storage temperature, fungal contamination, lactic acid bacteria, probiotics