

ABSTRACT

CHEMICAL ANALYSIS AND IDENTIFICATION OF BIOACTIVE PEPTIDES ETAWA GOAT'S MILK KEFIR AND BIOACTIVITY TEST

By

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Kefir is a probiotic drink that is good for health, such as overcoming lactose intolerance, antioxidants and antibacterials. Kefir can be made from cow's milk, goat's milk or soy milk. This study aims to determine the chemical composition and bioactive peptides in whey and curd kefir in Etawa goat milk and their bioactivity as antioxidants and antibacterials. The methods used in this study include fermentation of Etawa goat milk with 10 % kefir seeds; analysis of chemical composition of protein, fat, total lactic acid, and alcohol; organoleptic test; bioactivity test (antibacterial and antioxidant); and identification of peptides including determination of peptide molecular weight and analysis of amino acid composition. The results showed that protein, fat, total lactic acid, and alcohol were relatively better in kefir curd, namely 7.08 %; 1.46 %; 0.93 %; and 0.45 %. The addition of 40 % (v/v) honey had a significant effect ($p < 0.05$) on increasing the value of taste, aroma, texture and color in the organoleptic test of whey and curd kefir in Etawa goat milk. Antibacterial activity on kefir curd was in the strong category against *Bacillus cereus* bacteria with a clear zone diameter of 7 mm and medium category against *Escherichia coli* with a clear zone diameter of 6 mm. Antioxidant activity belongs to a very strong antioxidant group in curd with the addition of honey having an IC_{50} of 40.03 ppm. The kefir peptide weight in whey and kefir curd has three main bands, namely 10 kDa, 15 kDa, and 33 kDa. Meanwhile, curd kefir has one other band with a weight of 24 kDa which has a fairly high intensity. The results of the analysis of the amino acid composition of UPLC and LCMS showed that the 5 highest amino acids were glutamic acid, proline, leucine, serine, and lysine which had an effect on antioxidant activity.

Keywords: *whey* and *curd*, kefir, Etawa goat milk, peptides, antibacterial and antioxidants

ABSTRAK

ANALISIS KIMIA DAN IDENTIFIKASI PEPTIDA BIOAKTIF KEFIR SUSU KAMBING ETAWA SERTA UJI BIOAKTIVITASNYA

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Kefir merupakan salah satu minuman probiotik yang baik untuk kesehatan, seperti mengatasi intoleransi laktosa, antioksidan, dan antibakteri. Kefir dapat dibuat dari susu sapi, susu kambing, ataupun susu kedelai. Penelitian ini bertujuan untuk mengetahui komposisi kimia dan peptida bioaktif pada *whey* dan *curd* kefir susu kambing Etawa serta bioaktivitasnya sebagai antioksidan dan antibakteri. Metode yang digunakan pada penelitian ini meliputi fermentasi susu kambing Etawa dengan bibit kefir 10 %; analisis komposisi kimia protein, lemak, total asam laktat, dan alkohol; uji organoleptik; uji bioaktivitas (antibakteri dan antioksidan); dan identifikasi peptida meliputi penentuan berat molekul peptida dan analisis komposisi asam amino. Hasil penelitian menunjukkan bahwa protein, lemak, total asam laktat, dan alkohol relatif lebih baik pada *curd* kefir yaitu 7,08 %; 1,46 %; 0,93 %; dan 0,45 %. Penambahan madu 40 % (v/v) memberi pengaruh nyata ($p < 0,05$) terhadap peningkatan nilai rasa, aroma, tekstur dan warna pada uji organoleptik *whey* dan *curd* kefir susu kambing Etawa. Aktivitas antibakteri pada *curd* kefir termasuk kategori kuat terhadap bakteri *Bacillus cereus* dengan diameter zona bening 7 mm dan kategori sedang terhadap *Escherichia coli* dengan diameter zona bening 6 mm. Aktivitas antioksidan termasuk golongan antioksidan sangat kuat pada *curd* dengan penambahan madu memiliki IC_{50} 40,03 ppm. Berat peptida kefir pada *whey* dan *curd* kefir memiliki tiga pita utama yaitu 10 kDa, 15 kDa, dan 33 kDa. Sedangkan *curd* kefir terdapat satu pita lain dengan berat 24 kDa yang memiliki intensitas cukup tinggi. Hasil analisis komposisi asam amino UPLC dan LCMS terdapat 5 asam amino tertinggi yaitu asam glutamat, prolin, leusin, serin, dan lisin yang memberikan pengaruh terhadap aktivitas antioksidan.

Kata kunci: *whey* dan *curd*, kefir, susu kambing Etawa, peptida, antibakteri dan antioksidan