

PENGARUH INOKULASI *Pediococcus pentosaceus* M103 TERHADAP KARAKTERISTIK KEFIR SUSU KAMBING SELAMA PENYIMPANAN BEKU

INTISARI

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Kefir merupakan produk susu fermentasi yang dibuat dengan cara memfermentasi susu menggunakan kefir *grain* atau turunannya. Penelitian ini bertujuan untuk mengevaluasi karakteristik mikrobiologis, kimia, fisik, dan sensoris kefir susu kambing dengan inokulasi *Pediococcus pentosaceus* M103 selama penyimpanan beku. Kefir dibuat dengan cara memfermentasi susu kambing menggunakan 3% starter kefir selama 6 jam kemudian menginokulasi *Pediococcus pentosaceus* M103 dan difermentasi kembali selama 12 jam pada suhu ruang. Kefir diberi perlakuan inokulasi *Pediococcus pentosaceus* M103 pada level 0% dan 1% untuk tiga lama penyimpanan beku yaitu 0, 20, dan 40 hari. Data kualitas mikrobiologis (total BAL dan total yeast), kimia (keasaman, pH, kadar alkohol, kadar air, dan total solid), dan fisik (viskositas dan sineresis) dianalisis secara statistik dengan Rancangan Acak Lengkap (RAL) pola faktorial sedangkan data sensoris (warna, aroma, tekstur, rasa asam, rasa alkoholis, dan *overall*) dianalisis secara statistik dengan uji Friedman, dilanjutkan dengan uji Duncan (DMRT). Hasil penelitian menunjukkan bahwa inokulasi *Pediococcus pentosaceus* M103 berpengaruh sangat nyata ($P < 0,01$) terhadap viskositas dan sineresis, berpengaruh nyata ($P < 0,05$) terhadap total BAL, namun tidak berpengaruh nyata terhadap total yeast, keasaman, pH, kadar alkohol, kadar air, dan total solid. Lama penyimpanan berpengaruh sangat nyata ($P < 0,01$) terhadap total BAL, total yeast, kadar alkohol, viskositas, dan sineresis, namun tidak berpengaruh nyata terhadap keasaman, pH, kadar air, dan total solid. Interaksi inokulasi *Pediococcus pentosaceus* M103 1% dengan lama penyimpanan 40 hari berpengaruh sangat nyata ($P < 0,01$) terhadap sineresis dan tekstur, berpengaruh nyata ($P < 0,05$) terhadap total BAL, viskositas, dan *overall* namun tidak berpengaruh nyata terhadap total yeast, keasaman, pH, kadar alkohol, kadar air, total solid, warna, aroma, rasa asam, dan rasa alkoholis. Kualitas mikrobiologis pada penyimpanan 0 dan 20 hari memenuhi standar Codex tetapi pada penyimpanan 40 hari menjadi lebih rendah. Kualitas kimia, fisik, dan sensoris pada penyimpanan 0, 20, dan 40 hari memenuhi standar Codex, SNI, dan penelitian sebelumnya. Kesimpulannya, kefir susu kambing beku dengan inokulasi *Pediococcus pentosaceus* M103 selama penyimpanan 40 hari memiliki kualitas mikrobiologis, sineresis, tekstur, dan *overall* yang lebih baik dibandingkan kontrol. Kualitas kimia, fisik, dan sensoris kefir susu kambing beku dapat dipertahankan hingga penyimpanan 40 hari sedangkan kualitas mikrobiologis hingga penyimpanan 20 hari.

Kata kunci: Kefir, *Pediococcus pentosaceus* M103, Penyimpanan beku, Eksopolisakarida

INOCULATION EFFECT OF *Pediococcus pentosaceus* M103 ON THE CHARACTERISTICS OF GOAT MILK KEFIR DURING FROZEN STORAGE

ABSTRACT

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Kefir is a fermented milk product made by fermenting milk using kefir grains or kefir grain derivatives. This study aimed to evaluate the microbiological, chemical, physical, and sensory characteristics of goat milk kefir by inoculation of *Pediococcus pentosaceus* M103 during frozen storage. Kefir were obtained by fermenting goat milk using 3% kefir starter for 6 hours then inoculating *Pediococcus pentosaceus* M103 and fermenting it again for 12 hours at room temperature. The treatments in this study were *Pediococcus pentosaceus* M103 on level of 0% and 1% for three different frozen storage periods, i.e., 0, 20, and 40 days. Data on microbiological quality (total LAB and total yeast), chemical (acidity, pH, alcohol content, water content, and total solid), and physical (viscosity and syneresis) were analyzed statistically with a Completely Randomized Design (CRD) factorial pattern while sensory (color, aroma, texture, sour taste, alcoholic taste, and overall) data statistically analyzed by Friedman test, followed by Duncan's test (DMRT). The results showed that the inoculation of *Pediococcus pentosaceus* M103 had very significant effect ($P < 0.01$) on the syneresis and viscosity, significant effect ($P < 0.05$) on total LAB, but had no significant effect on total yeast, acidity, pH, alcohol content, water content, and total solid. Storage period had very significant effect ($P < 0.01$) on total LAB, total yeast, alcohol content, viscosity, and syneresis, but had no significant effect on acidity, pH, water content, and total solid. The interaction of the inoculation of *Pediococcus pentosaceus* M103 1% with storage period for 40 days had very significant effect ($P < 0.01$) on syneresis and texture, significant effect ($P < 0.05$) on total LAB, viscosity, and overall, but had no significant effect on total yeast, acidity, pH, alcohol content, water content, total solid, color, aroma, sour taste, and alcoholic taste. Microbiological quality at 0 and 20 days storage met the Codex standard but at 40 days storage it was lower. Chemical, physical, and sensory quality at storage 0, 20, and 40 days met the Codex, SNI, and previous research standards. As summary, frozen goat milk kefir with *Pediococcus pentosaceus* M103 added during storage for 40 days had better microbiological quality, syneresis, texture, and overall than control. Chemical, physical, and sensory quality can be maintained for 40 days, while microbiological quality for 20 days of storage.

Keywords: Kefir, *Pediococcus pentosaceus* M103, Forzen storage, Exopolysaccharide