

Pengaruh Probiotik *Lactococcus lactis* subsp. *cremoris* FC terhadap Gut Microbiota Wanita Konstipasi di Yogyakarta

Aninditya Ratnaningtyas¹, Tyas Utami¹, Toshio Suzuki², Masamichi Watanabe², Yayoi Gotoh², Toshinari Maruo², Endang Sutriswati Rahayu³

INTISARI

Konstipasi atau sembelit merupakan salah satu gangguan pencernaan kronis, yang ditandai dengan kesulitan buang air besar (BAB), frekuensi BAB ≤ 3 kali per minggu dengan ciri feses kering dan keras. *Lactococcus lactis* subsp. *cremoris* FC merupakan bakteri probiotik yang dapat mengatasi konstipasi. Penelitian ini bertujuan untuk mengetahui pengaruh pemberian kapsul probiotik *Lc cremoris* FC pada 40 wanita konstipasi di Yogyakarta, usia 20-50 tahun, selama 70 hari. Setiap subyek akan diberi dekstrin (placebo); dilanjutkan konsumsi 50 mg dan 100 mg *Lc. cremoris* FC secara berurutan masing-masing selama 2 minggu. Analisa *gut microbiota* dilakukan dengan metode Illumina MiSeq Sequencing pada 16s rRNA bagian V3-V4 dari ekstraksi DNA pada feses dan membandingkan persen kelimpahannya pada setiap fase (pre-treatment, placebo, dan Intervensi). Tidak terdapat perubahan signifikan pada komposisi bakteri *gut microbiota* setelah konsumsi probiotik. Pada konstipasi ditemukan komposisi persen kelimpahan bakteri filum *Firmicutes* and *Actinobacteria* yang tinggi dibandingkan filum *Bacteroidetes* dan *Proteobacteria*. Terdapat 3 bakteri utama yang ditemukan dengan analisa LeFSe Cladogram pada responden konstipasi yaitu *Erwinia*, *Tissierellaceae* dan *Collinsella*. Efek positif dari *Lc. cremoris* FC pada konsistensi feses bertahan hingga akhir penelitian dan membantu perubahan komposisi bakteri *gut microbiota* menuju normobiosis pada orang sehat yang mengalami konstipasi. Probiotik terbukti menurunkan tipe konsistensi feses, tipe 1 ($p=0.031$) dan tipe 2 ($p=0.049$), secara signifikan pada konstipasi. Mekanisme efek probiotik ini terhadap konstipasi perlu diteliti lebih lanjut pada penelitian selanjutnya.

Kata kunci : konstipasi, probiotik, *Lactococcus lactis* subsp. *cremoris* FC

¹Faculty of Agricultural Technology, Universitas Gadjah Mada, Yogyakarta, Indonesia

²FUJICCO Co., Ltd., 6-13-4 Minatojima-nakamichi, Chuo-ku, Kobe, Hyogo 650-8558, Japan

³Center for Food and Nutrition Studies, Universitas Gadjah Mada, Yogyakarta, Indonesia

Alteration of Gut Microbiota and Efficacy of *Lactococcus lactis* subsp. *cremoris* FC Probiotics on Constipated Women

Aninditya Ratnaningtyas¹, Tyas Utami¹, Toshio Suzuki², Masamichi Watanabe²,
Yayoi Gotoh², Toshinari Maruo², Endang Sutriswati Rahayu³

ABSTRACT

Constipation is one of disorders on digestive system with the symptoms such as difficulty of defecation, hard and dried feces, stomachache, discomfort on stomach area, with frequency of less than 3 times a week. *Lactococcus lactis* subsp. *cremoris* FC is one of probiotic bacteria which has been known its beneficial health effects to overcome the constipation among adults by altering gut microbiota. The aim of this single-blind study was to evaluate the consumption effects of *Lc cremoris* FC for 70 days on 40 constipated women subjects, aged at 20-50 years that suffered constipation in Indonesia. Each subjects were given dextrin (placebo); continued by 50 mg and 100 mg of *Lc. cremoris* FC daily for 2 weeks each. Bacterial 16S ribosomal RNA V3–V4 region was analyzed by using Illumina MiSeq Sequencing in comparison of the abundances of different genera among phase (pre-treatment, placebo, intervention). No significant difference was found in relative abundance (%) on each phase ($p>0.05$), *Firmicutes* and *Actinobacteria* were major abundant bacteria with *Bacteroidetes* and *Proteobacteria* as minor abundant. LeFSe Cladogram showing significantly bacterial abundance *Erwinia*, *Tissierellaceae* and *Collinsella*. These results suggest that the continuous ingestion of *Lc. cremoris* FC caused changes in intestinal microflora, improving defecation status and fecal characteristics in healthy subjects prone to constipation. In addition, the beneficial effect of *Lactococcus lactis* subsp. *cremoris* FC on stool consistency type 1 ($p=0.031$) and type 2 ($p=0.049$) remained after the probiotic supplementation was discontinued. The mechanism of how probiotics benefit patients with chronic constipation should be clarified in further studies.

Keywords : constipation, probiotics, *Lactococcus lactis* subsp. *cremoris* FC

¹Faculty of Agricultural Technology, Universitas Gadjah Mada, Yogyakarta, Indonesia

²FUJICCO Co., Ltd., 6-13-4 Minatojima-nakamichi, Chuo-ku, Kobe, Hyogo 650-8558, Japan

³Center for Food and Nutrition Studies, Universitas Gadjah Mada, Yogyakarta, Indonesia