

**SKRIPSI**

**PENGARUH MINUMAN PROBIOTIK *Lactobacillus casei shirota strain*  
TERHADAP PELEPASAN ION NIKEL BRAKET *STAINLESS STEEL***



Oleh:

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**Sebagai salah satu syarat  
Untuk memperoleh gelar sarjana pada  
Fakultas Kedokteran Gigi Universitas Andalas**

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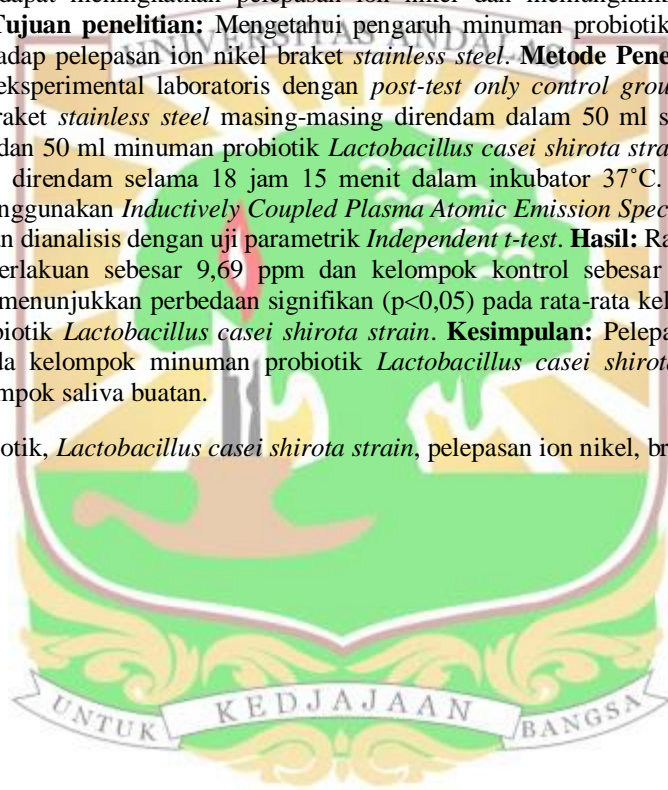
# Pengaruh minuman probiotik *Lactobacillus casei shirota strain* terhadap pelepasan ion nikel braket *stainless steel*

Meli Oktafiani

## ABSTRAK

**Latar Belakang:** Braket *stainless steel* merupakan komponen ortodontik cekat yang paling sering digunakan dalam perawatan ortodontik. Braket berada dalam rongga mulut dengan jangka waktu yang lama dapat menyebabkan terjadinya pelepasan ion logam, salah satunya adalah ion nikel. Perubahan pH lingkungan rongga mulut dapat disebabkan oleh makanan dan minuman yang dikonsumsi, seperti minuman probiotik. Minuman probiotik *Lactobacillus casei shirota strain* memiliki pH sekitar 3 – 4,5. pH yang rendah dapat meningkatkan pelepasan ion nikel dan memungkinkan terjadinya reaksi hipersensitivitas. **Tujuan penelitian:** Mengetahui pengaruh minuman probiotik *Lactobacillus casei shirota strain* terhadap pelepasan ion nikel braket *stainless steel*. **Metode Penelitian:** Penelitian ini adalah penelitian eksperimental laboratoris dengan *post-test only control group design* dengan 10 sampel. Sampel braket *stainless steel* masing-masing direndam dalam 50 ml saliva buatan sebagai kelompok kontrol dan 50 ml minuman probiotik *Lactobacillus casei shirota strain* sebagai kelompok perlakuan. Sampel direndam selama 18 jam 15 menit dalam inkubator 37°C. Pelepasan ion nikel kemudian diuji menggunakan *Inductively Coupled Plasma Atomic Emission Spectroscopy* (ICP-AES). Data hasil penelitian dianalisis dengan uji parametrik *Independent t-test*. **Hasil:** Rata-rata pelepasan ion nikel kelompok perlakuan sebesar 9,69 ppm dan kelompok kontrol sebesar 9,22 ppm. Analisis *Independent t-test* menunjukkan perbedaan signifikan ( $p < 0,05$ ) pada rata-rata kelompok saliva buatan dan minuman probiotik *Lactobacillus casei shirota strain*. **Kesimpulan:** Pelepasan ion nikel braket *stainless steel* pada kelompok minuman probiotik *Lactobacillus casei shirota strain* lebih besar dibandingkan kelompok saliva buatan.

**Kata Kunci:** probiotik, *Lactobacillus casei shirota strain*, pelepasan ion nikel, braket *stainless steel*



## ***The effect of Lactobacillus casei shirota strain probiotic beverage on the release of nickel ion from stainless steel bracket***

Meli Oktafiani

### **ABSTRACT**

**Background:** Stainless steel bracket is the most commonly used fixed orthodontic component in orthodontic treatment. The bracket in the oral cavity for a long time can cause the release of metal ions, one of which is nickel ion. Changes in the pH of the oral environment can be caused by the food and beverages consumed, such as probiotic beverages. The probiotic beverage with *Lactobacillus casei shirota* strain has a pH of around 3 – 4,5. Low pH can increase nickel ion release and allow hypersensitivity reactions to occur. **Objective:** To determine the effect of *Lactobacillus casei shirota* strain probiotic beverage on the release of nickel ion from stainless steel bracket. **Method:** This research was a laboratory experimental study with a post-test only control group design with 10 samples. Each stainless steel bracket sample was immersed in 50 ml of artificial saliva as a control group and 50 ml of *Lactobacillus casei shirota* strain probiotic beverage as a treatment group. Samples were immersed for 18 hours and 15 minutes in an incubator at 37°C. The release of nickel ion was tested using Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES). The research results were analyzed by a parametric Independent t-test. **Result:** The average release of nickel ion in the treatment group was 9,69 ppm and the control group was 9,22 ppm. Independent t-test showed a significant difference ( $p < 0,05$ ) in the mean of the artificial saliva and the *Lactobacillus casei shirota* strain probiotic beverage. **Conclusion:** The release of nickel ion from stainless steel bracket in *Lactobacillus casei shirota* strain probiotic beverage was greater than artificial saliva.

**Keywords:** probiotic, *Lactobacillus casei shirota* strain, the release of nickel ion, stainless steel bracket

