

Perbedaan Pengaruh Pemberian Tablet Fe dan BeeFe Powder (Instan Jus Bit) pada Fase Luteal dan Fase Menstruasi terhadap $\dot{V}O_2$ Max Atlet Remaja Putri

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INTISARI

Latar belakang: Defisiensi zat besi merupakan defisiensi zat gizi mikro yang sering terjadi pada atlet, terutama atlet remaja putri. Atlet remaja putri memiliki risiko lebih tinggi mengalami defisiensi zat besi akibat peningkatan kebutuhan zat besi pada usia remaja dan melalui beberapa mekanisme kehilangan zat besi terutama saat menstruasi dan latihan berat. Selain anemia, akibat dari defisiensi zat besi yaitu terjadinya penurunan daya tahan aerob ($\dot{V}O_2$ max), yang merupakan salah satu indikator performa atlet. Cara untuk mencegah penurunan performa ($\dot{V}O_2$ max) akibat defisiensi zat besi selain dengan suplementasi adalah melalui fortifikasi. Umbi bit (*Beta vulgaris* L.) merupakan salah satu sumber zat besi alamiah dan nitrat yang dapat meningkatkan performa atlet dengan melibatkan nitrit oksida (NO) pada mekanisme penghasilan energi. Sehingga fortifikasi zat besi pada umbi bit diharapkan mampu meningkatkan performa atlet secara lebih efektif.

Tujuan: Mengetahui perbedaan pengaruh pemberian Tablet Fe dan BeeFe Powder pada fase luteal dan fase menstruasi terhadap $\dot{V}O_2$ Max atlet remaja putri.

Metode: Penelitian ini menggunakan metode kuasi eksperimental dengan rancangan *control trial with posttest design*. Subjek penelitian yang berjumlah 30 orang dibagi ke dalam dua kelompok yaitu kelompok perlakuan dan kontrol. Kelompok perlakuan mendapatkan BeeFe Powder dan kelompok kontrol mendapatkan Tablet Fe. Intervensi diberikan selama 14 hari, yaitu 7 hari fase luteal dan 7 hari fase menstruasi. Data nilai $\dot{V}O_2$ max sebelum intervensi merupakan data sekunder, sedangkan data nilai $\dot{V}O_2$ max setelah intervensi diukur pada masing-masing subjek dengan metode Tes Balke.

Hasil: Hasil uji beda *independent sample t-test* menunjukkan tidak terdapat perbedaan signifikan rata-rata karakteristik subjek, asupan energi, zat gizi, cairan, dan *inhibitor* zat besi, latihan fisik serta nilai $\dot{V}O_2$ max pada kedua kelompok. Perbedaan signifikan hanya terdapat pada asupan karbohidrat dan oksalat yang lebih tinggi pada kelompok Tablet Fe ($p < 0,05$). Hasil uji *paired t-test* menunjukkan terdapat peningkatan nilai $\dot{V}O_2$ max pada kelompok Tablet Fe dan BeeFe Powder, namun tidak signifikan ($p > 0,05$).

Kesimpulan: Terdapat peningkatan nilai $\dot{V}O_2$ max atlet remaja putri pada kelompok Tablet Fe dan BeeFe Powder, namun tidak signifikan. Peningkatan nilai $\dot{V}O_2$ max atlet remaja putri pada kelompok BeeFe Powder lebih besar meskipun tidak signifikan dibandingkan dengan kelompok Tablet Fe.

Kata kunci: Tablet Fe, BeeFe Powder, Fase Luteal, Fase Menstruasi, $\dot{V}O_2$ Max, Atlet Remaja Putri.

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***Difference Effect of Iron Tablet and BeeFe Powder (Beetroot Instant Juice)
Supplementation in Luteal Phase and Menstrual Phase on $\dot{V}O_2$ Max of
Female Adolescent Athletes***

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ABSTRACT

Background: Iron deficiency is a micronutrient deficiency that often occurs in athletes, especially female adolescent athletes. Female adolescent athletes have a higher risk of iron deficiency due to increased iron requirements in adolescence and through several mechanisms of iron loss, especially during menstruation and strenuous exercise. In addition to anemia, the result of iron deficiency is a decrease in aerobic endurance ($\dot{V}O_2$ max), which is one indicator of athlete's performance. The way to prevent a decrease in performance ($\dot{V}O_2$ max) due to iron deficiency in addition to supplementation is through fortification. Beetroot (*Beta vulgaris* L.) is one source of natural iron and nitrate which can improve athlete's performance by involving nitric oxide (NO) in energy production mechanisms. Thus, iron fortification in beetroot is expected to be able to increase athlete's performance more effectively.

Objective: To investigate the difference effect of Iron Tablet and BeeFe Powder supplementation in luteal phase and menstrual phase on $\dot{V}O_2$ max of female adolescent athletes.

Methods: Using a quasi-experimental method with control trial with posttest design, 30 female adolescent athletes were divided into two groups which were treatment and control group. Treatment group ingested BeeFe Powder while control group consumes Iron Tablet daily for 14 days, namely 7 days of the luteal phase and 7 days of the menstrual phase. $\dot{V}O_2$ max before intervention is secondary data, while $\dot{V}O_2$ max after intervention is measured on each subject through Balke Test method.

Results: Independent sample t-test results showed that there were no significant differences in mean of subject characteristics, energy intake, nutrients, fluids, and iron inhibitors, physical exercise and $\dot{V}O_2$ max in both groups. Significant differences were only found in higher carbohydrate and oxalate intake in control group ($p < 0,005$). Paired t-test results showed that there was an increase of female adolescent athlete's $\dot{V}O_2$ max in both groups, but it was not significant ($p > 0,005$).

Conclusions: There was an increase of female adolescent athlete's $\dot{V}O_2$ max in both treatment and control groups, but it was not significant. The increase of female adolescent athlete's $\dot{V}O_2$ max in treatment group was greater than control group despite it was not significant.

Keywords: Iron Tablet, BeeFe Powder, Luteal Phase, Menstrual Phase, $\dot{V}O_2$ max, Female Adolescent Athletes.

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