# Pengaruh Pemberian Jus Buah Bit (Beta Vulgaris L.) terhadap Kadar $\tilde{V}O_2$maks Atlet Sepak Bola Remaja di Aji Santoso International Football Academy (ASIFA) Kota Malang Provinsi Jawa Timur

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## INTISARI

**Latar Belakang:** Performa atlet yang prima merupakan salah satu kunci kesuksesan atlet. Performa atlet yang prima dipengaruhi oleh $\tilde{V}O_2$maks yang sempurna. Namun, terkadang atlet sepak bola menerima latihan fisik yang ketat tanpa didukung oleh asupan gizi yang tepat sehingga dapat memicu stres oksidatif. Sehingga, perlu dilakukan manajemen gizi yang tepat salah satunya dengan pemberian jus buah bit yang mengandung antioksidan betalains dan nitrat anorganik agar kondisi stres oksidatif pada atlet dapat dikendalikan sehingga performa atlet tetap prima.

**Tujuan:** Mengetahui pengaruh pemberian jus buah bit terhadap kadar $\tilde{V}O_2$maks atlet sepak bola remaja di Aji Santoso *International Football Academy* (ASIFA) Kota Malang, Provinsi Jawa Timur.

**Metode:** Penelitian ini menggunakan metode *true experimental* dengan rancangan *randomized pre-test post-test control group design.* Subjek penelitian yang berjumlah 16 orang dibagi menjadi dua kelompok yaitu perlakuan dan kontrol. Kelompok perlakuan mendapatkan jus buah bit dan kelompok kontrol mendapatkan plasebo. Pemberian intervensi dilakukan selama 13 hari. *Multistage Fitness Test* (*Bleep Test*) dilakukan pada masing-masing subjek sebelum dan setelah intervensi melihat apakah terdapat perubahan kadar $\tilde{V}O_2$maks sebelum dan setelah pemberian intervensi.

**Hasil:** Hasil uji beda *independent sample t-test* menunjukkan bahwa terdapat perbedaan rata-rata berat badan dan indeks massa tubuh (IMT) secara bermakna antara kedua kelompok ($p < 0,05$). Tidak terdapat perbedaan bermakna rata-rata karakteristik subjek dari segi usia ($p = 0,083$), tinggi badan ($p = 0,69$), persen lemak tubuh *pre* ($p = 0,28$), persen lemak tubuh *post* ($p = 0,51$), dan $\Delta$persen lemak tubuh ($p = 0,083$). Selain itu, tidak terdapat perbedaan bermakna rata-rata asupan gizi, latihan fisik, dan gaya hidup serta kadar $\tilde{V}O_2$maks sebelum dan setelah intervensi ($p > 0,05$). Hasil uji beda *paired t-test* memperlihatkan hasil bahwa terdapat perbedaan yang signifikan antara hasil *pre-test* dan *post-test* $\tilde{V}O_2$maks pada kedua kelompok ($p < 0,05$). Sehingga, pemberian jus buah bit maupun plasebo berpengaruh secara signifikan terhadap peningkatan kadar $\tilde{V}O_2$maks atlet sepak bola remaja.

**Kesimpulan:** Terdapat peningkatan kadar $\tilde{V}O_2$maks atlet sepak bola remaja secara signifikan pada kelompok perlakuan dan kontrol. Hasil penelitian juga menunjukkan perubahan kadar $\tilde{V}O_2$maks pada atlet sepak bola remaja yang diberi jus buah bit lebih kecil meskipun tidak signifikan dibandingkan dengan kelompok yang diberi plasebo.

**Kata kunci:** $\tilde{V}O_2$maks, jus buah bit, nitrat anorganik, atlet, sepak bola.

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# *Effect of Beetroot Juice Supplementation (Beta Vulgaris L.) on V̇O$_2$max of Youth Soccer Athlete in Aji Santoso International Football Academy (ASIFA) Malang City, East Java Province*

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## ABSTRACT

***Background:*** *One of the key point of athlete's success is an excellent physical performance which determined by an excellent V̇O$_2$max. However, soccer athlete oftens do rigid yet severe physical training without exactly good management of nutrition consumption. In fact, the lack of antioxidant consumption can lead to oxidative stress condition. This oxidative stress condition could downsize the athlete's physical performance. Hence, there should be a good management of nutrition consumption such as supplementation of beetroot juice which contain betalains and inorganic nitrate so that the oxidative stress condition in soccer athlete can be reduced.*

***Objective:*** *To investigate the effect of beetroot juice supplementation on V̇O$_2$max of youth soccer athlete in Aji Santoso International Football Academy (ASIFA) Malang City, East Java Province.*

***Methods:*** *Using a true experimental method with randomized pre-test post-test control group design, 16 male soccer athletes were divided into two groups which were treatment and control group. Treatment group were ingested with beetroot juice while control group consumes placebo daily for 13 days. Multistage Fitness Test (Bleep Test) were done twice to each athletes before and after intervention to investigate whether there was alteration of V̇O$_2$max or not.*

***Results****: Clearly, by using independent sample t-test there was a significant difference in mean of body weight and body mass index (BMI) between groups ($p < 0,05$). There was no significant difference in mean of athlete's characteristics such as age ($p = 0,083$), body height ($p = 0,69$), pre body fat percentage ($p = 0,28$), post body fat percentage ($p = 0,51$), and ∆body fat percentage ($p = 0,083$). Besides, there was also no significant difference in mean of nutrition consumption, physical exercise, lifestyle, yet pre and post V̇O$_2$max between groups ($p > 0,05$). Paired t-test results showed that it were found to be significantly different between pre and post V̇O$_2$max measurement between groups ($p < 0,05$). Hence, the supplementation of beetroot juice and placebo significantly effects the increasing of youth soccer athlete's V̇O$_2$max in both groups.*

***Conclusions:*** *There was a significantly increasing of youth soccer athlete's V̇O$_2$max in both treatment and control groups. This research also showed that in treatment group tended to have a smaller increasing of youth soccer athlete's V̇O$_2$max than control group despite it was not significant.*

***Kata kunci:*** *V̇O$_2$max, beetroot juice, inorganic nitrate, athlete, soccer.*

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