



Differences in Maximal Oxygen Uptake Between A Traditional Diet and Vegetarian Diet

Author: Adrian Gonzalez

Faculty Sponsor: Dr. Judy Wilson, Brad Heddins

Cardiovascular Research Laboratory, The University of Texas at Arlington, Arlington, TX



Abstract

Introduction- There has been a recent rise in vegetarian athletes around the world. Very few studies have been performed on vegetarian diets and maximal oxygen uptake.

Purpose – The purpose of this study was to analyze the effects of a vegetarian diet on a maximal oxygen uptake test.

Methods – 5 healthy, non- smoking males, ages 21 to 28yrs (24.5 ± 2.7) followed a normal diet consisting of proteins coming primarily from animal products at least 5 days prior to the test. Each subject’s age, weight (kg), blood pressure (BP), and height (in) was obtained prior to testing. Body fat percentage was obtained with a bioelectrical impedance (BIA) device before testing was performed. A maximal exercise test was performed and heart rate, maximal oxygen uptake (VO₂ max), rating of perceived exertion (RPE), blood pressure, and time was recorded. After the initial visit and test, the subject was asked not to consume proteins from meats for four days, and was instead given suggestions of other foods from which to obtain protein requirements. Following the four day vegetarian diet, the subjects returned and performed another maximal exercise test with the same variables being recorded. The subjects’ protein requirements were calculated by using the equation for recommended daily allowance (RDA) of protein; weight in kg x 0.8.

Results- There was no statistical difference between maximal oxygen uptake following a vegetarian diet (p=.17). There was a statistical difference in time to exhaustion favoring a vegetarian diet (p=.008).

Conclusion- The results indicated that there was not a significant difference in maximal oxygen uptake between a normal diet, and a vegetarian diet in this particular male subject pool. Interestingly, a variable that was consistently different and improved in each subject was time to exhaustion. Each subject had a higher time to exhaustion after following a vegetarian diet. One of the causes of this could have been familiarity with the test. Another probable cause of increased time to exhaustion could have been carbohydrate loading. Although the subjects RDA of protein were being monitored, carbohydrates were not being monitored. If further studies are conducted, carbohydrate intake should be monitored as well as protein, and fat intake.

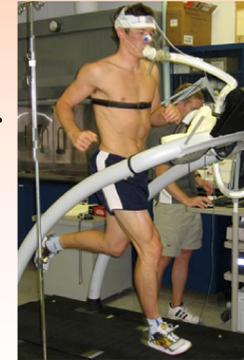
Purpose

The purpose of this study was to analyze the effects of a vegetarian diet on a maximal oxygen uptake test.

Methods

Subjects

- 5 healthy, non- smoking males, ages 21 to 28yrs (24.5 ± 2.7) followed a normal diet consisting of proteins coming primarily from animal products at least 5 days prior to the test.



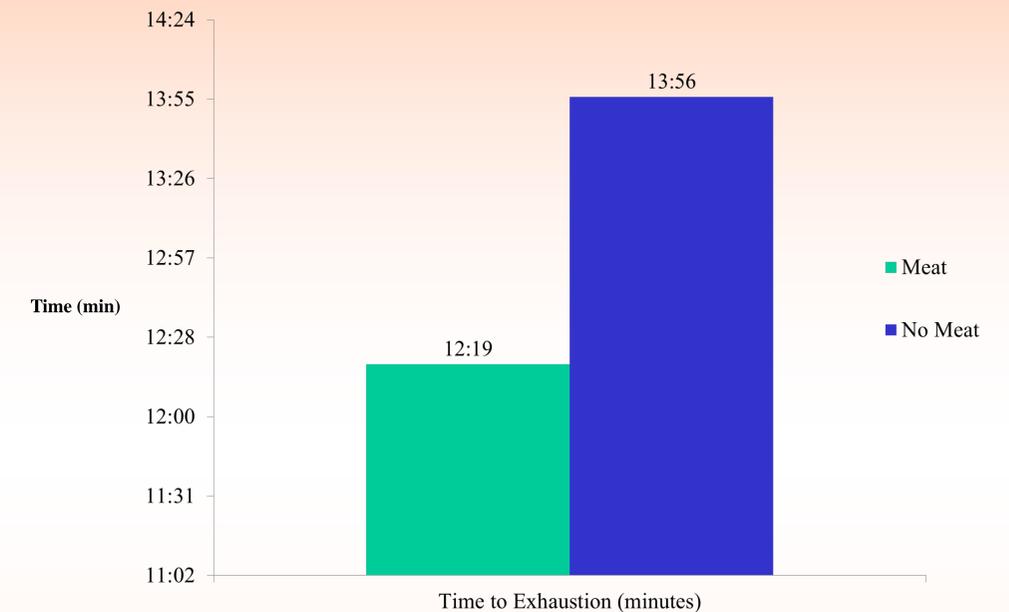
Protocol

- Each subject’s age, weight (kg), blood pressure (BP), and height (in) was obtained prior to testing. Body fat percentage was obtained with a bioelectrical impedance (BIA) device before testing was performed.
- A maximal exercise test was performed and heart rate, maximal oxygen uptake (VO₂ max), rating of perceived exertion (RPE), blood pressure, and time were recorded.
- After the initial visit and test, the subject was asked not to consume proteins from meats for four days, and was instead given suggestions of other foods from which to obtain protein requirements.
- Following the four day vegetarian diet, the subjects returned and performed another maximal exercise test with the same variables being recorded. The subjects’ protein requirements were calculated by using the equation for recommended daily allowance (RDA) of protein; weight in kg x 0.8

Results

Variable	Mean ± Standard Deviation		P-Value (p<.05)
	Meat	No Meat	
VO ₂ max	47.9±4.78	49±3.66	.179
Time	12:19±.044	13:56±.038	.008
RPE	9.67±2.29	8.87±1.96	.129
Body Fat %	12.82±3.37	12.52±3.41	.269

Results (cont’d)



There was no statistical difference between maximal oxygen uptake following a vegetarian diet (p=.17). There was a statistical difference in time to exhaustion favoring a vegetarian diet (p=.008).

Conclusions

The results indicated that there was not a significant difference in maximal oxygen uptake between a normal diet, and a vegetarian diet in this particular male subject pool. Interestingly, a variable that was consistently different and improved in each subject was time to exhaustion. Each subject had a higher time to exhaustion after following a vegetarian diet. One of the causes of this could have been familiarity with the test. Another probable cause of increased time to exhaustion could have been carbohydrate loading. Although the subjects RDA of protein were being monitored, carbohydrates were not being monitored. If further studies are conducted, carbohydrate intake should be monitored as well as protein, and fat intake.