International Journal of Academic Research
ISSN: 2348-7666; Vol.3, Issue-9(4), September, 2016
Impact Factor: 3.656; Email: drtvramana@yahoo.co.in

# Dark Chocolate: A Boost for Athletes' Performance – Review

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***Abstract :*** *Physical activity may be by means of direct involvement in various kinds of activities or else through leading active and quality life style. The researchers measured their heart rates and oxygen consumption levels. When performing endurance-based activity, being as economical as possible in energy provision is key to enhancing your performance. From these results, the consumption of dark chocolate has altered the participants' response to the activity and therefore could enhance their endurance performance."*
***Key words:*** *Chocolate, Flavanol, Athletic performance.*

**Introduction:** The health related physical fitness which is considered as key component in an individual's life is develop and protected through participation in various physical activities. This physical activity may be by means of direct involvement in various kinds of activities or else through leading active and quality life style. The quality life of an individual is measured not by the length of life alone but mainly on how an individual is possessed with better vigor and health to save him and the society. Too sporty to indulge in chocolate? Think again, says research published in The Journal of the International Society of Sports Nutrition. The findings suggest that a little dark chocolate may improve performance in fitness training. Chocolate, like beetroot, appears to boost performance. Beetroot juice is popular among elite athletes as a tool for enhancing performance, due to its high nitrate content. The nitrates in beetroot juice are converted to nitric oxide in the body, causing blood vessels to dilate and reducing oxygen consumption, helping athletes to maintain their pace for longer. [1.]The Mayo Clinic point out that chocolate and cocoa may play a role in reducing the risk of heart disease. The flavanols present in cocoa beans have antioxidant effects that reduce the cell damage involved in heart disease. They can also help to lower blood pressure and improve vascular function. However, Mayo Clinic warn that not all the benefits of chocolate have been confirmed. Chocolate should be consumed in moderation, they say, because the added fats and sugars can lead to weight gain and other health problems. Flavanols could be the key to chocolate's success : One of the flavanols in the cocoa bean and in dark chocolate is epicatechin. Epicatechin increases the production of nitric oxide in the body. Postgraduate research student [2.]The researcher wanted to know whether dark chocolate could provide similar benefits to beetroot. Researcher invited nine cyclists to participate in a study that was supervised by two professional cyclists and the researcher

**FLAVONOIDS**

Flavonoids are one of the largest nutrient families known to scientists, and include over 6,000 already-identified family members. Some of the best-known flavonoids include quercetin, kaempferol, catechins, and anthocyanidins. This nutrient group is most famous for its antioxidant and anti-inflammatory health benefits, as well as its contribution of vibrant color to the foods we eat. As an especially delicate group of nutrients with respect to cooking heats, flavonoids are often front and center in development of our cooking methods at WHFoods, where we always look for cooking methods best able to preserve nutrients. Due to unusually incomplete research information, we do not list values for specific flavonoids in our in-depth nutritional profiles for our foods, nor do we rank our foods based on their flavonoid content. However, in the Summary of Food Sources section of this article, you can find best food sources for five basic categories of flavonoids (including flavonols, flavan-3-ols, flavones, flavonones, and anthocyanidins).

**Methodology:** The age group between 18-21 cyclists underwent initial fitness tests to provide a baseline for comparison, and then they were put into two groups. All the participants swapped one of their daily snacks for 1.5 ounces of chocolate for 2 weeks. One group consumed a dark chocolate that was rich in flavanols, and the other group had white chocolate. After 2 weeks, the cyclists performed a series of cycling exercise tests, including moderate exercise and time trials, in Kurnool. The researchers measured their heart rates and oxygen consumption levels by ergometry cycle.

**Performance enhanced after eating chocolate**

The participants then took a break for a week, before switching chocolate types and repeating the 2-week trial and exercise tests. After eating dark chocolate, the riders used less oxygen when cycling at a moderate pace. They also cycled further in a 2-minute flat-out time trial.

## Role in Health Support

### Antioxidant Benefits

Because many flavonoids—and especially those belonging to two flavonoid subgroups called flavonols and flavan-3-ols—can be effective in reducing free radical damage to cells and other components in body tissue, they provide antioxidant benefits. It is not clear, however, if we should be thinking about flavonoids as falling into the same category as more widely known antioxidant nutrients like vitamin C or vitamin E.

One reason for this is because their concentration in the bloodstream is so much lower. Another reason lies in the fact that many of the antioxidant functions of the flavonoids are not performed by the flavonoids themselves, but by forms of the flavonoids that have been altered by our metabolism. Even though we do not know all the details about the way flavonoids function as antioxidants, however, studies have documented better protection of certain cell types—for example, red blood cells—following consumption of flavonoid-rich foods. Blueberries, for example, have been repeatedly studied in this context for their flavonoid-related antioxidant benefits.

### Cardiovascular System Benefits

Not surprisingly, since many problems in the cardiovascular system involve problems with oxidative stress and inflammation, the antioxidant and anti-

inflammatory benefits from food flavonoids provide direct support for this body system. In the bloodstream, flavonoids have been shown to help protect LDL cholesterol molecules from oxygen-related damage. This LDL protection, in turn, helps to lower risk of atherosclerosis. Flavonoids including rutin and hesperidin have also been shown to increase the strength and integrity of the blood vessel walls, lowering risk of blood vessel problems. In one study, adding a spice mix to a meal of beef—a mix that contained such flavonoid-rich herbs as oregano, rosemary, garlic, ginger, and black pepper—led to a significant improvement in vascular function over the next several hours. Yet herbs and spices are by no means the only foods studied in this regard; similar effects have been demonstrated for soy foods, chocolate, pomegranate juice, and grape juice.

Finally, numerous flavonoids—including quercetin and rutin—have been shown to help prevent excessive clumping together of platelet cells that could otherwise lead to unwanted clogging of the blood vessels. This property of flavonoids is called an "anti-aggregatory" property, and it's yet another way in which these phytonutrients help support the cardiovascular system.

In 2014, a research group looked at cardiovascular benefits related to the flavonoid content of fruits and vegetables. These researchers were able to determine that six total fruit and vegetable servings did a better job at protecting cardiovascular health than four total servings. They also decided upon six total servings of fruits-plus-vegetables as their minimal recommendation for heart health. Many of our daily sample menus at WHFoods go beyond this recommendation and include between 6-10 total servings from these two food groups.

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