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# The Effect of Red Guava Juice to MDA (Malondealdehyde) Levels on The Athletes in The Garuda Bintang Football School Getting Sub-Maximal Physical Activity

1st Winara
*STIKES Harapan Bangsa,*
*Awardee LPDP, BUDI DN, 2017*
Banda Aceh, Indonesia
winara.kim@gmail.com

***Abstract*—The purpose of this study was to determine effect of red guava juice to changes in MDA levels in the blood of atheletes after getting physical activity sub-maximum, difference effect between a high pulse and low pulse rate on the results of MDA levels, effect of red guava juice 100 grams and 150 grams of the MDA levels in the blood, understand the interaction between red guava juice and pulse on the results of MDA. The study used an experimental design. The study population is athelete in Garuda Bintang Football School amount 63 people. Sample study of 16 people who were taken using purposive sampling technique. The sample consisted of 8 players who get physical activity sub-maximum (pulse) high and 8 players getting physical activity sub-maximum (pulse) is low. The instrument used to retrieve the data are: (1) physical activity such as running 2400 meters (2) measurement of pulse rate and (3) test MDA (Malondialdehyde). Data collection techniques to test and measurement Data analysis techniques used ANOVA.**

***Keywords— red guava juice, sub-maximal pulse, MDA (malondialdehyde).***

## I. INTRODUCTION

Physical activity is an activity developed with the hope of living can provide added value in the form of improved quality, prosperity and human dignity. Physical activity can provide an impact on various aspects of life such as psychology, social, economic, cultural, political and biological function. Against the biological function of physical activity is a modulator with a broad spectrum of influence and can occur at various levels of functionality.

Regular physical exercise if done as part of a healthy lifestyle would be a lot beneficial for health and may affect/reduce the risk of cardiovascular disease, osteoporosis and diseases other degenerative. In this case one of the mechanisms that come into play a role is decreased fatty tissue, lipid profile, hormonal changes and improving the function of the mitochondria. Physical exercise can also increases the function of muscles, maintaining muscle mass and improve the cardiovascular system of adaptation this disclosed serum antioxidant stress injury and cell aftersevere physicaal exercise [8].

Heavy physical activity carried out with the aim of them to improve the well-being, health, and dignity of human life. Examples of heavy physical activities such as anaerobic exercise such as swimming and run a short distance. In certain circumstances, heavy physical activity can give negative influences that is impeding or disturbing the physiological processes in the body.

Physical exercise can also cause or trigger an imbalance between the production of free radicals with antioxidants, which are known as oxidative stress, during maximum physical exercise, consumption of oxygen in the body can be increased up to 20 times. While the consumption of oxygen by muscle fibers is estimated to increase up to 100 fold. Increased consumption of oxygen this led to an increased production of free radicals that can cause cell damage. Oxidative stress is a State where the production of free radicals exceeds the cellular antioxidant defense system, so that damage cell membranes of muscle cells, including brain cells and the liver.

Malondialdehyde (MDA) according to [24] is one of the compounds are products of a reaction is the concentration of lipids that are used as marker (marker) occurrence of oxidative stress. On the State of oxidative stress, an increase in serum MDA levels significantly. When the State of oxidative stress MDA levels resolved, again declining. Free radicals are atoms or molecules have electron pair on their outer orbital and can stand on its own [9]. Most free radicals react rapidly with other atoms to fill the orbitals that are not paired, so that free radicals normally stand alone in just a short period of time before it merges with other atoms.

One of the indicators used to determine oxidative stress in humans is the levels of MDA (Malondialdehyde) which is

a result of the concentration of lipids in the body due to free radicals [9]. Antioxidants are distinguished into two groups namely

Antioxidant enzymatic and non-enzymatic. Antioxidant enzymatic antioxidant also known as deterrent, consisting of superoksid dismutase, catalase, and glutathione peroxidase. Antioxidant enzymatic antioxidant also known as non-breaking the chain. A chain-breaking antioxidant consisting of the vitamin C, vitamin E, and beta carotene [8].

One of the antioxidants that are able to ward off free radicals is ascorbic acid or known as vitamin C. Vitamin C is an antioxidant non enzimanatis of micronutrients that is soluble in water. Vitamin C acts as redaktor for different free radicals. It also minimizes the occurrence of damage to cells and tissues caused by oxidative stress. Antioxidant vitamins proven to react against free radicals and reduces the ability to perform microscopic damage.

Askrobat Acid is the first line of Defense of antioxidants in plasma, and also effectively protects Low-Density Lipoproteins (LDL) against oxidative stress". Vitamin C is also believed capable of overcoming fatigue caused by physical load that occurs when working or while moving. During exercise or activity with a pretty heavy workload the excretion of vitamin C increases through urine and sweat. So we can say needs vitamin C increase on sportsman [2].

Vitamin C is an important vitamin that is soluble in water. These vitamins are often consumed by people. Up to now, the function of vitamin C which is known as the immune system enhancer, collagen formation, suppression of aging and as a flu remedy. The community know that this vitamin is also useful for people who often work. Vitamin C is a water-soluble antioxidant and is present in the cytosol and liquid ekstrasel. Although in very small amounts, vitamin C can protect proteins, lipids, carbohydrates, and nucleic acids from the damage caused by the process of the formation of prooksidan produced by normal metabolism.

Vitamin C can prevent damage to the network by reducing the production of oxidants. Yet to be explained that vitamin C plays directly in the process of recovery of the tissue or indirectly play a role in that process. A great many kinds of foods that contain vitamin C, whether natural or synthesis in the form of vitamin supplements or foods and drinks containing vitamins. Because the needs of sportsmen and because of easy it is the concentration of vitamin C is lost in natural foods. Then to meet the needs of the vitamin C needs to be given additional and natural vitamin C.

Red guava fruit contains a lot of vitamin C, 4 times as much vitamin C is in the content of citrus fruits. According to [14]. Red guava fruit contains Vitamin C as 887 mg in 100 g/red guava. Guajava (*Psidium guajava. L*) containing compounds, β-carotene vitamiC, vitamin E, which has a bitter taste and potency antioxidants.

## II. MATERIALS AND METHODS

TABLE 1. 2X2 EKSPERIMENT FACTORIAL DESIGN

| **The pulse sub-maximum (B)** | **Red Guava Juice** | |
|---|---|---|
| | ***100 gram ($A_1$)*** | ***150 gram ($A_2$)*** |
| High ($B_1$) | $A_1B_1$ | $A_2B_1$ |
| Low ($B_2$) | $A_1B_2$ | $A_2B_2$ |

Description:
A1 = guava Juice 100 gram
A2 = guava Juice 150 gram
B1 = high pulse rate
B2 = low pulse rate
A1B1 = groups given 100 red guava juice grams on samples that get physical exercise sub-maximal results with a high pulse rate
A2B1 = group given red guava juice 150 grams on samples that get physical exercise sub-maximal results with a high pulse rate
A1B2 = group given red guava juice 100 g in samples that get physical exercise sub-maximal results with low pulse rate
A2B2 = group given red guava juice 150 grams on samples that get physical exercise sub-maximal results with a low pulse rate.

The research using experimental methods in a 2x2 eksperiment factorial design. Sampling technique is the purposive technic be based on age the atheletes with sampling and retrieved samples as many as 16 people out of a total population of 63 people. Technique of data analysis used the test of anava two lines with the program SPSS 20.0 and 5% significance level, followed by the Tukey test.

This research uses experimental methods with a 2x2 eksperiment factorial design. Two variables are manipulated simultaneously to investigate the influence of each extent against variable bound and influences caused by the interaction between some variable.

## III. RESULTS AND DISCUSSION

*A. Comparison of influence between the awarding of the red guava juice against the levels of MDA on Garuda Bintang football school athlete.*

To test the hypothesis that states the difference between the influence the awarding of the red guava juice against the levels of MDA Garuda Bintang football school athlete, used variansi analysis of two way obtained the following results:

Based on the results of the analysis the influence of the difference between the giving of red guava juice against the levels of MDA (Malondialdehyde) on Garuda Bintang football school athlete acquired F value count of 40.334 and F table of 4,747 and with p value or level the significance of 0.000, because the value of Fcount (40,334) > F table (4,747) as well as the significance level of 0.000 < 0.05. alternative hypothesis (Ha) which means that read "there is have a difference between influence awarding of red guava juice beans against the levels of MDA (*Malondialdehyde*) on athlete Garuda Bintang Football School "received. And null hypothesis (Ho) which reads "there is heve not difference between influence awarding of red guava juice against the levels of MDA (*Malondialdehyde)* on athlete

Garuda Bintang Football School " was rejected and because there is a difference then followed by Tukey test.

TABLE II. ANALYSIS VARIANCE OF INFLUENCE BETWEEN THE GRANTING OF RED GUAVA JUICE AGAINST THE LEVELS OF MDA ON GARUDA BINTANG FOOTBALL SCHOOL ATHLETE

| **Source Of Variation** | **Add Red Guava Juice** | **Total** |
|---|---|---|
| ***dk*** | 1 | 12 |
| ***JK*** | 25.5 | 7.6 |
| ***JKT*** | 25.5 | 0.6 |
| ***Fc*** | 40.334 | |
| ***Ft*** | 4.747 | |
| ***Sig*** | 0.00 | |
| ***Exp*** | Signifikan | |

TABLE III. THE RESULTS OF THE AVERAGE LEVELS OF MDA (MALONDIALDEHYDE) ON ATHELETE GARUDA BINTANG FOOTBALL SCHOOL BY ADMINISTERING RED GUAVA JUICE 100 G AND 150 G

| **Dependent Variabel : Result of MDA Test** | | | |
|---|---|---|---|
| ***Administering red guava juice*** | | ***100 gram*** | ***150 gram*** |
| ***Mean*** | | 13.548 | 11.025 |
| ***Std.Error*** | | .281 | .281 |
| ***95% Confidence Interval*** | ***Lower Bound*** | 12.936 | 10.413 |
| | ***Upper Bound*** | 14.159 | 11.637 |

The average result of the levels of MDA (Malondialdehyde) on athlete Garuda Bintang Football School by administering red guava juice can be seen in the table III.

Based on the table are obtained that the results of the average levels of MDA (Malondialdehyde) on athletes Garuda Bintang Football Scholl by administering red guava juice 100 g obtained average results 13,548 whereas on average yield levels of MDA (Malondialdehyde) athletes on Garuda Bintang Football Scholl by administering red guava juice 150 grams obtained average results of 11,025 so that the difference between the average results of the levels of MDA (Malondialdehyde) between the granting of red guava juice 100 g and 150 g of 2.523.

*B. The comparison between the influences of the get physical activity sub-maximal (pulse) high and low test results against the levels of MDA on Garuda Bintang Football School athlete*

To test the hypothesis that states the difference between the influence of the get physical activity sub-maximal (pulse) test against high and low levels of MDA (Malondialdehyde) on the athletes in the school's football Garuda Bintang used analysis variansi Two Way obtained the following results.

TABLE IV. ANALYSIS VARIANCE OF INFLUENCE BETWEEN THE GET PHYSICAL ACTIVITY SUB-MAXIMAL (PULSE) HIGH AND LOW TEST RESULTS AGAINST THE LEVELS OF MDA (MALONDIALDEHYDE)

| **Source Of Variation** | **Get physical activity sub-maximal (pulse)** | **Total** |
|---|---|---|
| ***dk*** | 1 | 12 |
| ***JK*** | 3.080 | 7.572 |
| ***JKT*** | 3.080 | 0.361 |
| ***Fc*** | 4.881 | |
| ***Ft*** | 4.747 | |
| ***Sig*** | 0.047 | |
| ***Exp*** | Signifikan | |

TABLE V. THE RESULTS OF THE AVERAGE LEVELS OF MDA (MALONDIALDEHYDE) ON THE ATHLETES IN SCHOOL FOOTBALL GARUDA BINTANG GET PHYSICAL ACTIVITY SUB-MAXIMAL (PULSE) HIGH AND LOW

| **Physical activity sub-maximal** | | **High** | **Low** |
|---|---|---|---|
| ***Mean*** | | 12.725 | 11.847 |
| ***Std.Error*** | | .281 | .281 |
| ***95% Confidence Interval*** | ***Lower Bound*** | 12.113 | 11.236 |
| | ***Upper Bound*** | 13.337 | 12.459 |

Based on the results of an analysis of the difference between the influence of influence get physical activity sub-maximal (pulse) high and low test results against the levels of MDA (Malondialdehyde) on the athletes in the Garuda Bintang school's football retrieved the value of the Fc of Ft and 4,881 of 4,747 and with p value or significance level of 0.047 F value, because F count (4,881) > F table (4,747) as well as the level of significance of 0.047 0.05. Ha meaning < which reads "there's a difference between influence the get physical activity sub-maximal (pulse) high and low test results against the levels of MDA (Malondialdehyde) on the athletes in Garuda Bintang school's football "received. And Ho which reads "there is no difference between who gets influence physical activity sub-maximal (pulse) high and low test results against the levels of MDA (Malondialdehyde) on the athletes in the Garuda Bintang school's football " was rejected.

Because there is a difference then followed by Tukey test. The average result of the levels of MDA (Malondialdehyde) on the athletes in the Garuda Bintang school's football get physical activity sub-maximal (pulse) high and low can be seen in the table V.

Based on the table results obtained average levels of MDA (Malondialdehyde) on the athletes in school football Garuda Bintang get physical activity sub-maximal (pulse) high earned an average of 12,725 results while the average results the levels of MDA (Malondialdehyde) on the athletes in school football Garuda Bintang get physical activity sub-maximal (pulse rate) lower average results obtained of 11,847 so that the difference between the average results of the levels of MDA (Malondialdehyde) between the get physical activity sub-maximal (pulse) the highs and lows of 0.878

*C. The interaction between the granting of red guava juice against the levels of MDA (Malondialdehyde) on the*

*athletes in school football Garuda Bintang get physical activity sub-maximal (pulse)*

To test the hypothesis that the third namely interaction used variansi analysis of Two Way. The results of the calculation analysis of the difference between the giving of red guava juice against the levels of MDA (Malondialdehyde) on on the athletes in school football Garuda Bintang get physical activity sub-maximal (pulse) obtained the table v.

Based on the results of the analysis of the interaction between the granting of guava juice red against the levels of MDA (Malondialdehyde) on the athletes in the Garuda Bintang school's football are get physical activity sub-maximal (pulse) obtained the value of 4.8 Fcount and Ftabel of 4.7 as well as with the p value or significance level of 0.048, because the value of Fcount (4.8) > F table (4.7) as well as the level of significance of 0.05 meaning 0.048 < Ha which reads "There is interaction between the awarding of the red guava juice against the levels of MDA ( Malondialdehyde) on the athletes in the Garuda Bintang school's football are get physical activity sub-maximal (pulse) "received. And Ho which reads "There is no interaction between the awarding of the red guava juice against the levels of MDA (Malondialdehyde) on the athletes in the Garuda Bintang school's football are get physical activity sub-maximal (pulse)" was rejected.

The average yield of the average levels of MDA (Malondialdehyde) between the granting of red guava juice and getting physical activity sub-maximal (pulse) can be seen in the table vi.

TABLE VI. SUMMARY TWO FACTOR OF ANOVA

| I | dk | JK | JKT | Fc | Ft | Sig | Exp |
|---|---|---|---|---|---|---|---|
| ***A*** | 1 | 3.1 | 3.1 | 4.9 | 4.7 | 0.05 | Sig |
| ***B*** | 1 | 25.5 | 25.5 | 40.3 | 4.7 | 0.000 | Sig |
| ***C*** | 1 | 3.1 | 3.1 | 4.8 | 4.7 | 0.048 | Sig |
| ***D*** | 12 | 7.6 | | | | | |
| ***E*** | 15 | 39.2 | 0.6 | | | | |
| ***F*** | 16 | 2454.3 | | | | | |

* Description:
I= Source Of Variation
A= Physical Activity Sub Maximal
B= Administering Red Guava Juice
C=Interaction (physical activity sub-maximal x administering guava juice red)
D= Interracial
E= Error
F = Total

TABLE VII. THE RESULTS OF THE AVERAGE LEVELS OF MDA (MALONDIALDEHYDE) BETWEEN THE GRANTING OF RED GUAVA JUICE AND GETTING PHYSICAL ACTIVITY SUB-MAXIMAL (PULSE).

| **Physical activity sub-maximal** | **High** | **Low** |
|---|---|---|
| **Administering red guava juice** | 100 g | 150 g | 100 g | 150 g |
| **Mean** | 13.55 | 11.90 | 13.54 | 10.15 |
| **Std.Error** | .397 | .397 | .397 | .397 |
| **95% Confidence Interval** ***Lower Bound*** | 12.68 | 11.03 | 12.68 | 9.28 |
| ***Upper Bound*** | 14.41 | 12.76 | 14.41 | 11.01 |

Based on the tables retrieved the results test average MDA (Malondialdehyde) on sample groups with get physical activity sub-maximal (pulse) high by administering red guava juice 100 grams of retrieved results average 13,550, while the average test results of MDA (Malondialdehyde) on sample groups with get physical activity sub-maximal (pulse) high by administering red guava juice 150 grams of 11,900.

Based on the tables retrieved the results test average MDA (Malondialdehyde) on sample groups with get physical activity sub-maximal (pulse) by administering red guava juice 100 g obtained results average 13,545, while the average test results of MDA (Malondialdehyde) on sample groups with get physical activity sub-maximal (pulse) by administering red guava juice 150 grams of 10,150.

Based on research this is in line with the statement according to Reference [23] moderate exercise is a healthy practice. However, exhaustive exercise generates free radicals. This can be evidenced by increases in lipid peroxidation, glutathione oxidation, and oxidative protein damage. It is well known that activity of cytosolic enzymes in blood plasma is increased after exhaustive exercise. This may be taken as a sign of damage to muscle cells. The degree of oxidative stress and of muscle damage does not depend on the absolute intensity of exercise but on the degree of exhaustion of the person who performs exercise. Training partially prevents free radical-formation in exhaustive exercise. Treatment with antioxidants such as vitamins C or E protects in part against free radical-mediated damage in exercise. Xanthine oxidase is involved in free-radical formation in exercise in humans and inhibition of this enzyme with allopurinol decreases oxidative stress and muscle damage associated with exhaustive exercise. Knowledge of the mechanism of free-radical formation in exercise is important because it will be useful to prevent oxidative stress and damage associated with exhaustive physical activity.

## IV CONCLUSION

There is a difference between influence awarding of red guava juice against the levels of MDA (Malondialdehyde) on the athletes in the Garuda Bintang football school, difference between who gets influence physical activity sub-maximal (pulse) high and low test results against the levels

of MDA (Malondialdehyde) on the athletes in the Garuda Bintang school's football and there is an interaction between the awarding of the red guava juice against the levels of MDA (Malondialdehyde) the athletes in the Garuda Bintang school's football are get physical activity sub-maximal (pulse). On samples that get physical activity sub-maximal (pulse rate) is low better given red guava juice 150 grams compared to samples that get physical activity sub-maximal (pulse).

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