

LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU PEER REVIEW
KARYA ILMIAH : JURNAL ILMIAH

Judul Artikel Ilmiah : Regular High Intensity Circuit Training Improves Attention Function and Reaction Time Among Male Young Adults

Penulis Artikel Ilmiah : Tiara Augustina Putri, Muflihatul Muniroh, Yosef Purwoko, Ainun Rahmasari Gumay, Tanjung Ayu Sumekar, Endang Ambarwati

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ORIGINAL ARTICLE

Effect of Mangosteen (*Garcinia Mangostana* L.) Peel Supplementation on Alkaline Phosphatase Serum in Male Students After Heavy Exercise

Rika Nailuvar Sinaga, Zulaini, Fajar Apollo Sinaga, Jumadin IP

Teaching Staff of Sports Science Faculty Universitas Negeri Medan (UNIMED), 20221 Medan, Indonesia

ABSTRACT

Introduction: Physical exercise can increase metabolism in the liver due to the presence of alkaline phosphatase (ALP), which subsequently causes the oxidative stress. In order to reduce this effect, the consumption of natural antioxidant is commonly performed, and one of these antioxidants could be found in mangosteen peel that contains high content of Xanthone and Procyanidin. This study aims to understand the effect of mangosteen peels to alkaline phosphatase serum in male student group who have performed heavy exercises. **Methods:** A true experimental study was carried out with pre- and post-test, and 21 male students were recruited which were divided into two groups. To understand the effect, a control group which was instructed to prescribe placebo was involved, whereas the other group was invited to consume mangosteen peels with dosage of 550 mg as their supplements. Both of the groups were prescribed for two weeks before performing the exercise, in which they were invited to perform treadmill exercise which had 75%-85 of intensity for three times a week. The ALP levels were measured on the final day of treatments after performing the heavy exercise. **Results:** A significant rise of ALP levels were demonstrated by the control group with p value <0.05, in contrast the group who has consumed the mangosteen peel as their supplements had significantly lower ALP levels compared to the placebo group. **Conclusion:** It is concluded that mangosteen peels had the ability in lowering the ALP serum levels in male students who have performed heavy exercise.

Keywords: Mangosteen, Alkaline phosphatase, Heavy exercise

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INTRODUCTION

A physical exercise is defined as the physical activity performed by individual due to certain purposes for adjusting, managing, or improving the condition of body-parts, in which it is regularly performed with structured plans (1). As it is purposively planned and regularly performed, this exercise has been reported to prevent certain physical and mental diseases including hypertension, diabetes, osteoporosis and obesity; depression respectively, as well as cancer (2).

The movements performed in physical exercise increase the oxygen consumption done by the body via the muscle fibers (3). However, at the same time, blood flow and metabolism decrease significantly resulting an increase of liver oxidative stress (4), in which this biological mechanism might have affected the enzyme activities

within the liver. Oxidative stress can be measured by assessing levels of malondialdehyde (MDA), this is because MDA is the result of lipid peroxidation caused by free radicals during physical exercise (5). Several studies have reported that exercise can increase Alanine aminotransferase (ALT), Alkaline phosphatase (ALP) and aspartate aminotransferase (AST) (6,7,8).

In lowering the risk of oxidative stress caused by unbalanced features in the liver system, natural and synthetic antioxidants have been suggested to be consumed (5,9). Natural antioxidants as liver protectors have been investigated; a purple sweet potato can reduce the level of hepatitis index enzymes in serum such as aspartate aminotransferase (AST) and alanine aminotransferase (ALT) (10). The effect of natural antioxidants on several enzyme parameters in the liver has also been studied by using the ethanol extracts of *Ziziphus mauritiana* leaves in reducing the levels of AST, ALT and ALP serum levels by involving rats as the subjects (11). Furthermore, *Tulbaghia violacea* rhizomes can reduce AST, ALT and ALP levels in atherosclerotic mice that suffer from liver damage (12).

ORIGINAL ARTICLE

The Association Between Plasma Natural Antibodies and Inflammatory Biomarkers Two Weeks After Calving in Cows with No Dry Period

Novi Mayasari¹, Henk K. Parmentier², Erminio Trevisi³, Bas Kemp², Ariette van Kneegsel²

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ABSTRACT

Introduction: Improved energy balance, metabolic status, and natural antibodies (NAb) has been shown in cows with no dry period, however these cows showed increased inflammation status in early lactation. The aim of this study was to determine the association between plasma natural antibodies and inflammatory biomarkers in cows with no dry period during the first two weeks postpartum. **Methods:** Holstein-Friesian dairy cows (n=55) were selected. Before enroll to the experiment, cows were clinically healthy. Plasma samples were collected at week 1 and 2 after calving and were analyzed for NAb binding megalin-keyhole limpet hemocyanin and inflammatory biomarkers. **Results:** Cows with no dry period in this study had an improved energy balance and maintain NAb titers but increased ceruloplasmin (inflammatory biomarkers) in early lactation. In this study we found a significant correlation between NAb IgG binding KLH and haptoglobin in plasma ($P < 0.01$). However, there were no correlations between albumin, cholesterol and NAb (IgG and IgM) binding KLH. **Conclusion:** This study demonstrate that cows with no dry period have an improved energy balance and maintained the level of natural antibodies in plasma. Moreover, IgG titers in plasma might be correlated with haptoglobin due to inflammation during calving until 2 wk postpartum.

Keywords: Continuous milking, Inflammation, Antibodies

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INTRODUCTION

During transition period, immune status in dairy cows were suppressed and need to be increased. It is known that dairy cows are characterized with immune suppression during transition period, which is related with severe negative energy balance (EB), and high rate of infection diseases and metabolic disorders (8). Innate immunity is the first line defense against infection (1), and natural antibodies (NAb) are a part of humoral innate immunity before get any antigenic stimulation (2). CD5+ B-1 cells produce natural antibodies in healthy individuals and NAb mainly consist of immunoglobulin M (IgM), IgG and IgA (3,4). In previous research, NAb binding keyhole limpet hemocyanin (KLH) were higher in cows with an

improved EB in early lactation (7). Transition period is the crucial time for dairy cows especially in the first two weeks after calving. In early lactation, cows experienced negative EB, which is related to immunosuppression (9). Negative EB was not only related to NAb but also was associated with enhanced level of inflammatory biomarkers (10) and metabolic disorders (11) in dairy cows during early lactation.

In early lactation, increased disease rates are commonly reported among high-yielding dairy cows and characterized by the occurrence of an inflammatory response indicated by acute phase protein (APR) (12). Inflammation evokes white blood cells (WBC) to release of tumor necrosis factor-alpha (TNF- α) and (interleukin-1 and -6) (IL 1 or 6). As a consequence, TNF- α and IL-1 or 6 triggered the release of acute phase response (13). During the response of acute phase protein, positive acute phase reactants (+AP) including haptoglobin and ceruloplasmin were increased in plasma and negative