

## Consumption of oat bran reduces triacylglycerols levels and oxidative stress in Metabolic Syndrome subjects

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**Introduction:** Metabolic syndrome (MetS) is a multifactorial condition that has been related to accelerated atherosclerosis, increased risk of diabetes and cardiovascular disease. Evidences suggest a relationship between MetS and oxidative stress, which is an imbalance between antioxidant and pro-oxidant substances, with a predominance of the latter. Inflammation and hyperglycemia, for example, lead to the production of reactive oxygen species, resulting in increased oxidative stress, which may trigger atherosclerosis. Oat is known to be a great source of the soluble fiber  $\beta$ -glucan and it is recognized the benefit of a diet rich in soluble fibers in improving plasma levels of cholesterol and reducing cardiovascular risk. **Objective:** The aim of the present study was to evaluate the efficacy of an oat bran-enriched diet on lipids profile and oxidative stress markers in patients with MetS. **Methods:** This was a randomized controlled trial with a single-blind design. Twenty-six patients with MetS were enrolled in this study. The group consisted of individuals between 25 and 72 years old selected according to National Cholesterol Education Program - Adult Treatment Panel III criteria. Patients were instructed to consume 30 grams of oat bran per day (with 10% of  $\beta$ -glucan) and maintain their usual diet, physical activity and lifestyle during the three months of the study. Patients were followed up every thirty days to check blood pressure, body weight and waist circumference. Blood sampling and evaluation of the nutritional status (to ensure that there was no change in eating habits) occurred at the beginning and at the end of the study. Data were analyzed by the Wilcoxon matched-pairs test and was presented as median and minimum – maximum values. The level of significance was set at 5% ( $p \leq 0,05$ ). **Results:** In 90 days of treatment, total plasma antioxidant capacity had increased around 17% [806.92 (547.09 – 1079.80) vs. 897.22 (728.81 – 1141.90)]. On the other hand, the levels of lipid hydroperoxides had reduced about 20% by the colorimetric method [0.98 (0.48 – 1.87) vs. 0.84 (0.51 – 1.34)] and 103% by chemiluminescence [25768.00 (5518.00 – 73421.00) vs. 13674.00 (3029.00 – 36476.00)]. The nitric oxide metabolites had reduced 41% [4.27 (2.37 – 8.51) vs. 3.04 (1.15 – 6.53)]. Only advanced oxidation protein products levels did not show significant results [127.12 (57.76 – 213.25) vs. 107.28 (55.58 – 295.50)]. The total plasma antioxidant capacity/advanced oxidation protein products ratio and total plasma antioxidant capacity/lipid hydroperoxide ratio were, respectively, 17.3% [6.45 (0.64 – 12.58) vs. 8.04 (3.05 – 14.83)] and 135.71% [0.03 (0.01 – 0.12) vs. 0.07 (0.03 – 0.32)] increased. Regarding the lipids profile, the oat bran-enriched diet resulted in a significantly decrease of 17% in the levels of triacylglycerols [195.00 (45.00 – 418.00) vs. 168.50 (56.00 – 429.00)]. **Conclusion:** These data support that oat bran consumed in a regularly basis can reduce oxidative stress and triacylglycerols levels in patients with MetS.

**Keywords:**  $\beta$ -glucan, Lipid profile, Metabolic syndrome, Oat bran, Oxidative stress.

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