# Effect of dietary n-3 PUFA from microalgae on blood, liver, brain, kidney and heart lipids

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The health benefits associated with regular consumption of n-3 polyunsaturated fatty acids (PUFA) are well established, mainly due to the presence of docosahexaenoic (DHA, 22:6n-3) and eicosapentaenoic (EPA, 20:5n-3) fatty acids in diet. In the past few decades, beneficial associations have been made with the consumption of microalgae as a new and potential source of n-3 PUFA in diet. Microalgae, are sea producers of long chain fatty acids and appear very attractive as new dietary sources of PUFAs. This study attempted to evaluate the effect of daily supplementation with the microalga *Diacronema vlkianum* in rodents. Fourteen/15 male Wistar rats/group respectively were orally administered, by gavage, with 0 (control) or 100mg/Kg/day of microalgae suspended in water. The behaviour of the animals was monitored daily.
Animals were sacrificed after 15 and 60 days of supplementation. Tissues (heart, liver, brain, and kidney) were collected, preserved at -80ºC, for subsequent fatty acid profiling by GC-FID. The total blood was also collected and washed red blood cells (RBC) membranes were obtained. Statistical analysis of obtained data consisted of two-sample assuming unequal variances t-student's. Comparisons were made between microalgae-supplemented and control groups, at the selected sacrifice time points. Differences were considered significant at $p<0.05$.
*D. vlkianum* main n-3 PUFA were 20:5n-3 (EPA), 22:5n-3 (DPA) and 22:6n-3 (DHA) used as biomarkers of tissue incorporation of microalgae components. The RBC used as good indicator of lipid incorporation after long term diets showed a higher percentage of EPA and DPA in treated rats 1.32% ± 0.11 and 2.32% ±0.10 compared with controls 0.59%±0.07 and 1.65%±0.16, respectively. Besides, the values for the total n-3 fatty acids in RBC had a significant difference in treated rats (10.40% ± 0.25) face to controls (9.05%±0.28). In cardiac tissue, results showed a positive increase of EPA with significant differences in treated rats (0.43%± 0.01) contrasting to controls (0.16%±0.09). In the liver tissue significant differences among the two different groups, for the fatty acids EPA and DPA were observed. Therefore, EPA in treated rats had a

percentage of 2.11% ±0.19 comparing to smaller value in controls 0.93%±0.14. DPA ranged from 2.05%± 0.25 in treated rats and 1.17%± 0.28 in controls. In brain and kidney tissue no significant differences were observed between the two groups.

The increase of EPA and DPA in the animals' tissues suggests a promising dietary use of microalga *D. vlkianum.*