

Influence of protein intake associated with oils (sunflower, soya, coconut, salmon) on red blood cells with oxidative stress in the rat. JC M'Fouara, MN Bouziane, J Prost, J Belleville (*Université de Bourgogne, Faculté des Sciences Mirande, Unité de Recherche de Nutrition Cellulaire et Métabolique, BP 138, 21004 Dijon Cedex, France*)

Lipids originating from diets, particularly polyunsaturated fatty acids (PUFA), are incorporated into cell membranes. PUFA lipoperoxidation involves the formation of oxygen-derived free radicals, which could alter PUFA contained in cell membrane phospholipids.

Our aim in this paper was to study the total anti-oxidative defence status of rats utilizing circulating cells. Balanced protein (20% casein) and depleted protein (2% casein) diets were combined with 5% of various oils, as decrease in bioavailability of fatty acids is observed with protein deprivation.

Over a 28-d period, 8 groups of 6 male Wistar rats were fed 8 different diets: SFC (20% casein + 5% sunflower oil), SFd (2% casein + 5% sunflower oil), SC (20% casein + 5% soya oil), Sd (2% casein + 5% soya oil), SAC (20% casein + 5% salmon oil), SAd (2% casein + 5% salmon oil), COC (20% casein + 5% coconut oil), COd (2% casein + 5% coconut oil). Blood was removed, washed red cells were resuspended at 11% hematocrit value and subjected to organic free radical generator (KGRL 400 Spiral RD kit, 21560 Couternon, France). The

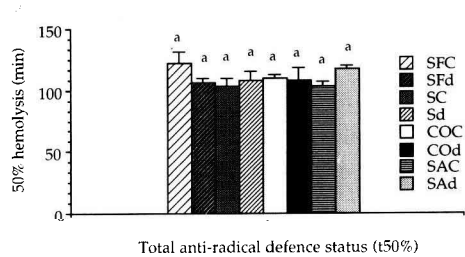


Fig 1. Values are means \pm SE for 6 rats. Classification of the means are performed using Duncan's new multiple range test. Means differ significantly if letters are different ($P < 0.05$).

released hemoglobin was analyzed by spectrophotometry. The total anti-radical defence status was expressed as the length of time to reach 50% hemolysis ($T_{50\%}$ in min).

No significant difference was observed in the $t_{50\%}$ in spite of the various oils in control groups. Values of $T_{50\%}$ were not modified by protein depletion. This time value was not significantly extended for SFC and SAd groups.

Total anti-radical defense status in red blood cells was not modified in the short term by balanced or depleted protein diets, despite the use of various oils. This could be due to the long turnover of membrane phospholipids, and protein depletion did not modify membrane composition in the short term.