

Regulation of the flow of fatty acids (FA) by futile cycle (TAG/FA cycle) in white adipose tissue (WAT) is an important mechanism of controlling metabolism of FA and therefore its regulation is in the interest of research as a possible therapeutic target in the treatment of obesity and insulin resistance. The study of the murine model suggests that the treatment of the n-3 PUFA with mild caloric restriction (CR) probably induces the TAG/FA cycle mainly in epididymal depot. It also reduces inflammation in WAT and the risk of cardiovascular diseases. We focused on monitoring the gene expression encoding key enzymes of the TAG/FA cycle (PEPCK, ATGL, HSL, DGAT1 and DGAT2) in dorzolumbar (DL), gonadal (GON) and mesenteric (MEZ) depot in a murine model C57BL/6 using qPCR. We were interested in the influence of the composition of fats in the diet, the influence of administration of n-3 PUFA with combination of 10% CR and the difference of gene expression among depots of WAT. The results indicate that the supplementation of high-fat diet with n-3 PUFA contributes mainly to reduction of gene expression for DGAT2 and the combination of n-3 PUFA and CR increases expression of genes influencing the TAG/FA cycle. In MEZ unlike GON and DL fat depot were no significant differences in gene expression, while the different composition of fats in the diet had an influence on the expression of monitored genes.