**Influence of diet on gene expression after physical stress**

**Introduction**

It is already well known that physical activity and also diet have an influence on gene expression. The aim of this bachelor thesis was to determine these nutrient-gene interactions after physical stress. Many studies were made about this topic, although some study results may be contrary. However the hypothesis about the effects of a high carbohydrate diet on gene expression after physical stress is assured.

**Material and Methods**

The aim of my bachelor thesis was to summarize the different effects of diet on gene expression. The thesis is based on a literature research on scopus and sciencedirect. Criteria as the number or the physical fitness of the subjects were not a reason for exclusion, since there are not so many studies in this field, although the physical fitness of the subjects was mentioned in the studies.

**Results and discussion**

Several studies in the published literature have examined positive effects of a high carbohydrate diet on gene expression before, after or during physical stress. A high carbohydrate diet leads to an increase of genes in the energy-, glucose- and fat-metabolism and also to changes in the immune system. GLUT4, FAT/CD36, UCP3 and glycogenin mRNA were increased in the study of Akrinstall et al. (2004) after a high-carbohydrate diet at recovery. Anti inflammatory cytokines as IL-10, IL-1ra and the inflammation responsive cytokine IL-6 were reduced by carbohydrate supplementation. [Nieman et al, 2003]

But not only high carbohydrate diets were observed, also high-fat diets. The study of Cameron-Smith et al (2010) indicates that short-term consumption of a high-fat diet selectively increases the gene expression of FAT/CD36 and 8-HAD in human skeletal muscle. The findings of Hellsten et al. were that antioxidant supplementation leads to a greater UCP3 mRNA expression.

**Conclusion**

Some results may be contrary but most of the studies show that a high carbohydrate diet leads to positive effects. Even though few studies conclude that a high-fat diet has positive effects, the evidence still shows that a high carbohydrate diet should be recommended.
Literature


