



EFFECT OF FISH OIL AND RESTRICTED FEEDING ON BLOOD LIPID PROFILE IN A RABBIT MODEL OF CASTRATION INDUCED OBESITY

N. GRIGOROVA¹, B. BJORN DAL², ZH. IVANOVA¹, G. PENCHEV³,
E. VACHKOVA¹, R. BERGE², T. MIRCHEVA-GEORGIEVA¹
& I. PENCHEV GEORGIEV¹

¹Department of Pharmacology, Animal Physiology and Physiological Chemistry, Faculty of Veterinary Medicine, Trakia University, Stara Zagora, Bulgaria; ²Department of Clinical Science, University of Bergen, Bergen, Norway; ³Department of Veterinary Anatomy, Histology and Embryology, Faculty of Veterinary Medicine, Trakia University, Stara Zagora, Bulgaria

Summary

Grigorova, N., B. Bjorndal, Zh. Ivanova, G. Penchev, E. Vachkova, R. Berge, T. Mircheva-Georgieva & I. Penchev Georgiev, 2017. Effect of fish oil and restricted feeding on blood lipid profile in a rabbit model of castration induced obesity. In: *Proceedings of the International Scientific Conference “Veterinary Medicine in Service of People”*, 6-7 October 2017, Stara Zagora, Bulgaria

Obesity is a complex condition leading to dyslipidaemia and increased risk for cardio-vascular diseases. Dietary omega-3 polyunsaturated fatty acids (omega-3 PUFAs) and restricted diet hold great promise in prevention and combating obesity associated abnormalities in lipid metabolism. Fish oil is rich in two of the most bioactive omega-3 PUFAs – eicosapentaenoic acid and docosahexaenoic acid. *Purpose:* This study was conducted to investigate the effect of fish oil supplementation and restricted feeding on blood lipid profile in experimentally induced obesity in rabbits by castration. *Material and methods:* The experiments were carried out with 30 male New Zealand white rabbits randomly divided into 5 groups of 6 rabbits each (GrNC group – non-castrated, full-diet fed, non-treated, GrC100 group – castrated, full-diet fed, non-treated; GrFO100 group – castrated, full-diet fed, treated with fish oil; GrC50 group – castrated, 50% restricted-diet fed, non-treated; GrFO50 group – castrated, 50% restricted fed, treated with fish oil). Blood samples were taken at the end of treatment period (2 months) and plasma lipids concentrations were determined. *Results:* Plasma total cholesterol (TC) and LDL-cholesterol concentrations in all castrated groups were higher ($p < 0.05$; $p < 0.01$) than in GrNC, the increase being less pronounced in full diet fed and fish oil treated rabbits (GrFO100). Conversely, HDL-cholesterol levels and HDL-cholesterol/LDL-cholesterol ratio in GrFO100 were higher than in GrC100 ($p < 0.05$; $p < 0.001$) and GrNC ($p < 0.001$; $p < 0.05$). No effect of fish oil treatment and restricted feeding on plasma triglycerides (TG) levels were found except for a marked increase in GrFO50. There was a significant decrease in free fatty acids (FFAs) concentration in fish oil treated, full-diet fed rabbits (GrFO100) compared to GrC100. Interestingly, in fish oil treated, 50% restricted-diet fed rabbits (GrFO50) we found a several fold increase in plasma concentrations of TC, LDL-cholesterol, TG, TC/HDL-cholesterol ratio, TG/HDL-cholesterol ratio and a marked decrease in HDL-cholesterol and HDL-cholesterol/LDL-cholesterol ratio. In addition, no effect of 50% restricted

feeding alone on blood lipids concentrations were detected apart from a significant ($p < 0.001$) decrease in plasma FFAs level. *Conclusion:* In conclusion, the results of this study indicate that the effect of fish oil on blood lipid profile in castrated rabbits was differentially affected by the diet: improvement in full-diet fed rabbits and worsening in highly (50%) restricted fed rabbits was observed.

Key words: blood lipid profile, fish oil, obesity, rabbit, restricted feeding