Introduction: Dietary protein amount and source, hypertrophy resistance training (RT) and anabolic-androgenic steroids (AAS) may affect body weight and plasma and hepatic lipid profile. Material and methods: 157 adult male Wistar rats were randomly distributed in 16 experimental groups resulting in: normal-protein (NP) or high-protein (HP) diets, whey or soy-protein diets, with or without RT and with or without AAS, for 3 months. Results and discussion: Final body weight was lower in the RT and AAS groups compared to sedentary and non-AAS groups, respectively (all, p<0.001). Plasma total cholesterol (TC) was lower for the HP compared to the NP diets, for the whey compared to the soy-protein diets and for the AAS compared to the non-AAS groups (all, p<0.001). Plasma HDL-cholesterol was higher in the RT groups (p<0.05) but lower for the AAS groups (p<0.001), the HP and the soy-protein diets (p<0.05). Plasma triglycerides (TAG) were lower for the HP diet (p<0.001), for the RT (p=0.002) and the non-AAS groups (p=0.001). Liver TC was lower for the NP (p<0.01), for the soy-protein (p<0.05) and for the AAS groups (p<0.001). Liver TAG were lower for the whey-protein diet (p<0.001), RT and non-AAS groups (both, p<0.05). Some interactions were found, such as the greater effect of AAS on reducing body weight of rats that performed RT or ingested a HP diet (all, p<0.05). HDL-cholesterol was higher when RT was combined with HP diets (p=0.010) or non-AAS and when HP diets were combined with non-AAS (both, p<0.001). Groups that combined RT with non-AAS administration obtained the lowest hepatic TAG (p<0.05). Conclusion: Among all the interventions tested, AAS was the factor that most negatively affected plasma and hepatic lipid profile, whereas HP diets and RT could benefit lipid profile, especially when combined.

Keywords