

EFFECTS OF THE COWPEA GLN-ASP-PHE PEPTIDE DAILY ADMINISTRATION IN RATS FED A SATURATED HIGH-FAT DIET

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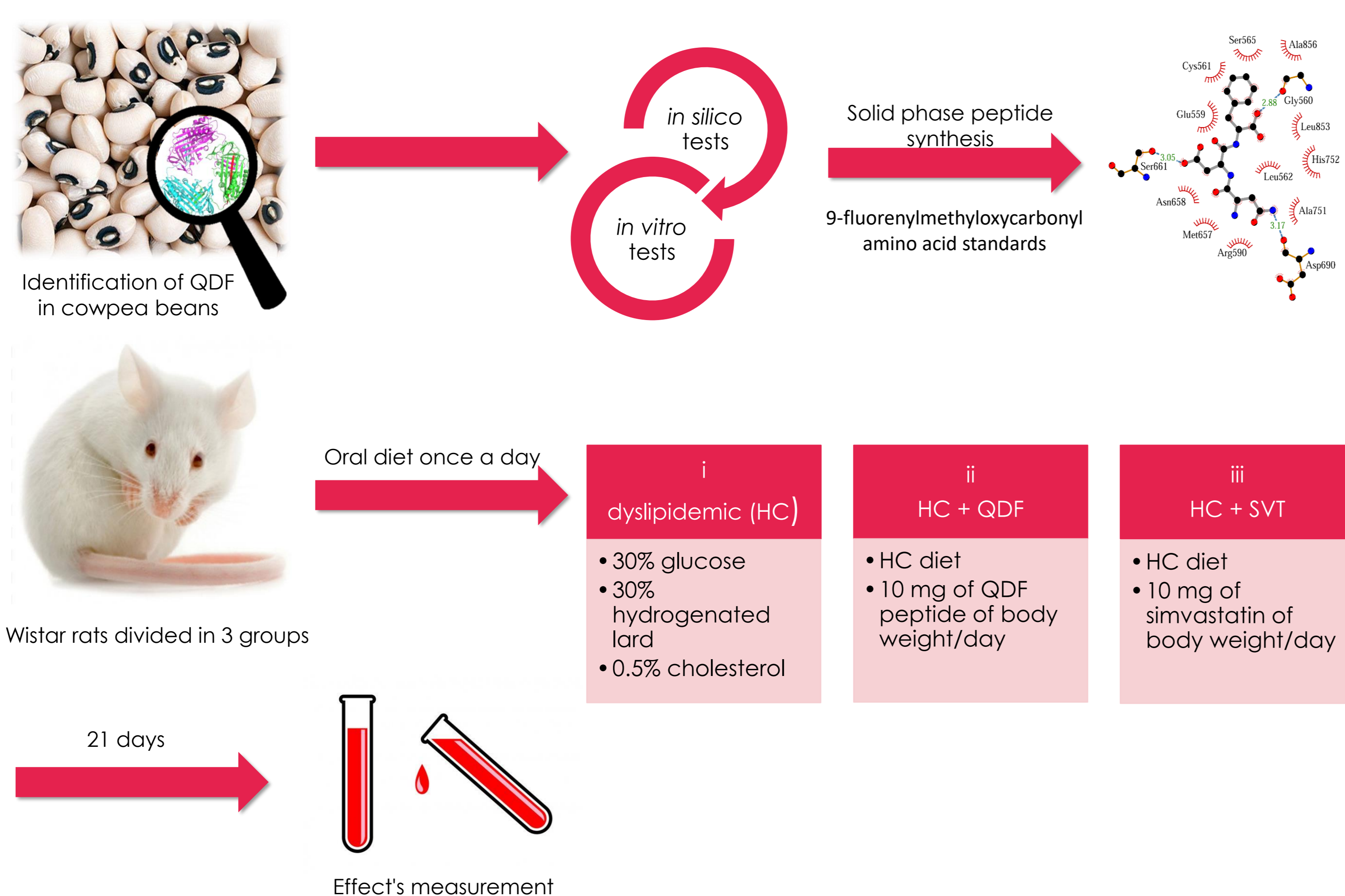
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INTRODUCTION

Among Chronic Non-Communicable Diseases (CNCDs), cardiovascular diseases are the main cause of death worldwide (approximately 31%), and they are considered a public health problem due to non-fatal events and associated pathological damage.^{1,2} Dyslipidemia is the main risk factor for the development of cardiovascular diseases, and it is recommended to reduce the levels of total cholesterol and LDL to reduce the risk of its development.³ Several drugs are used to control dyslipidemia, especially statins, which act by inhibiting 3-Hydroxy-3-methylglutaryl Coenzyme A Reductase (HMGR); however, some side effects are associated with this class of drugs.⁴ In this context, peptides from vegetables, capable of modulating lipid metabolism are being studied. Previous studies have shown that cowpea bean's β -vignin protein exerts a hypocholesterolemic effect in rats fed a hypercholesterolemic diet.⁵ Recently, results showed that the QDF peptide, derived from β -vignin, was able to inhibit HMGR *in vitro* and *in silico*.⁶ Thus, in this study we will show the effects of the Gln-Asp-Phe (QDF) peptide in rats fed a diet rich in saturated fat.

METHODS



RESULTS

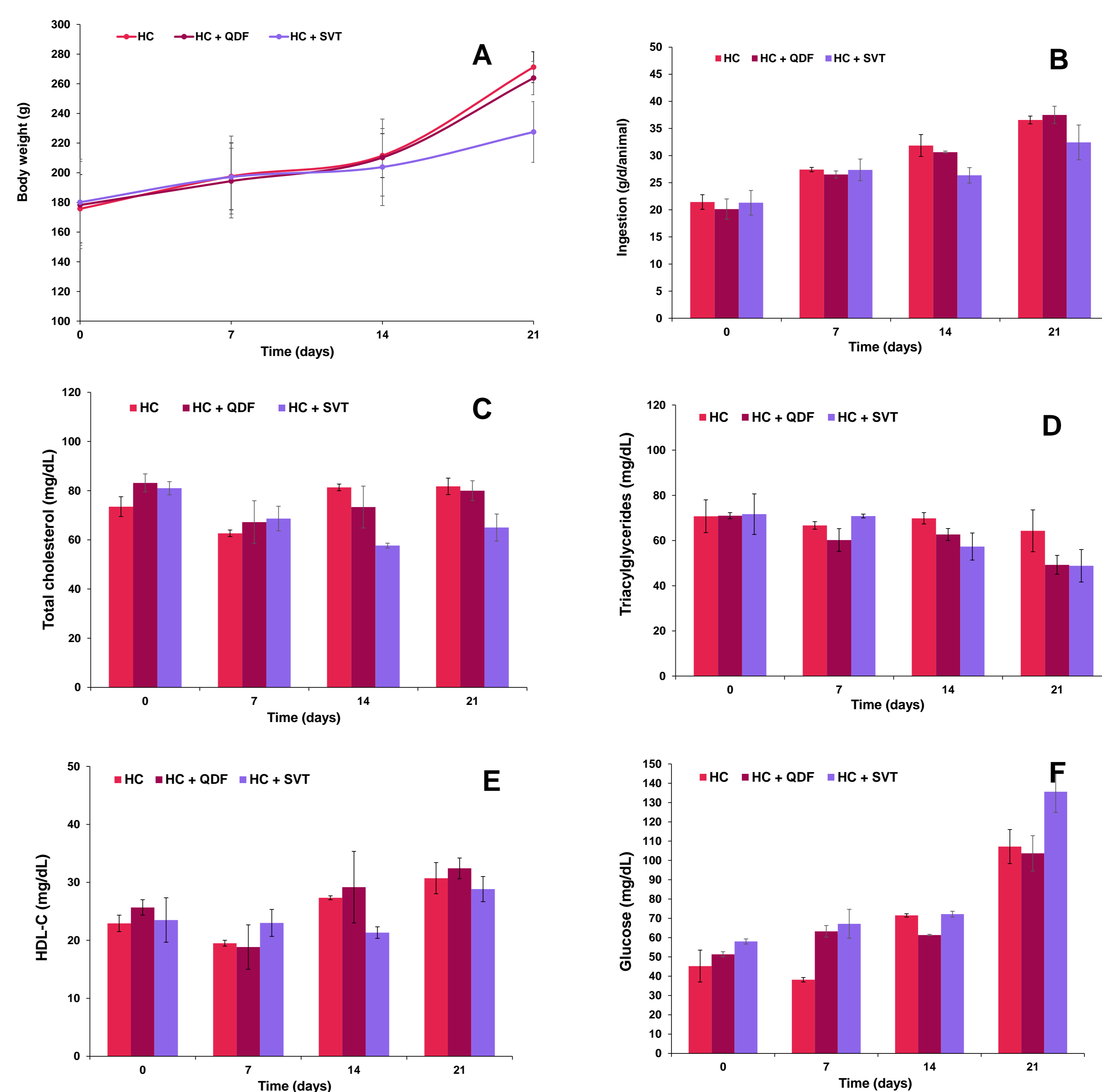
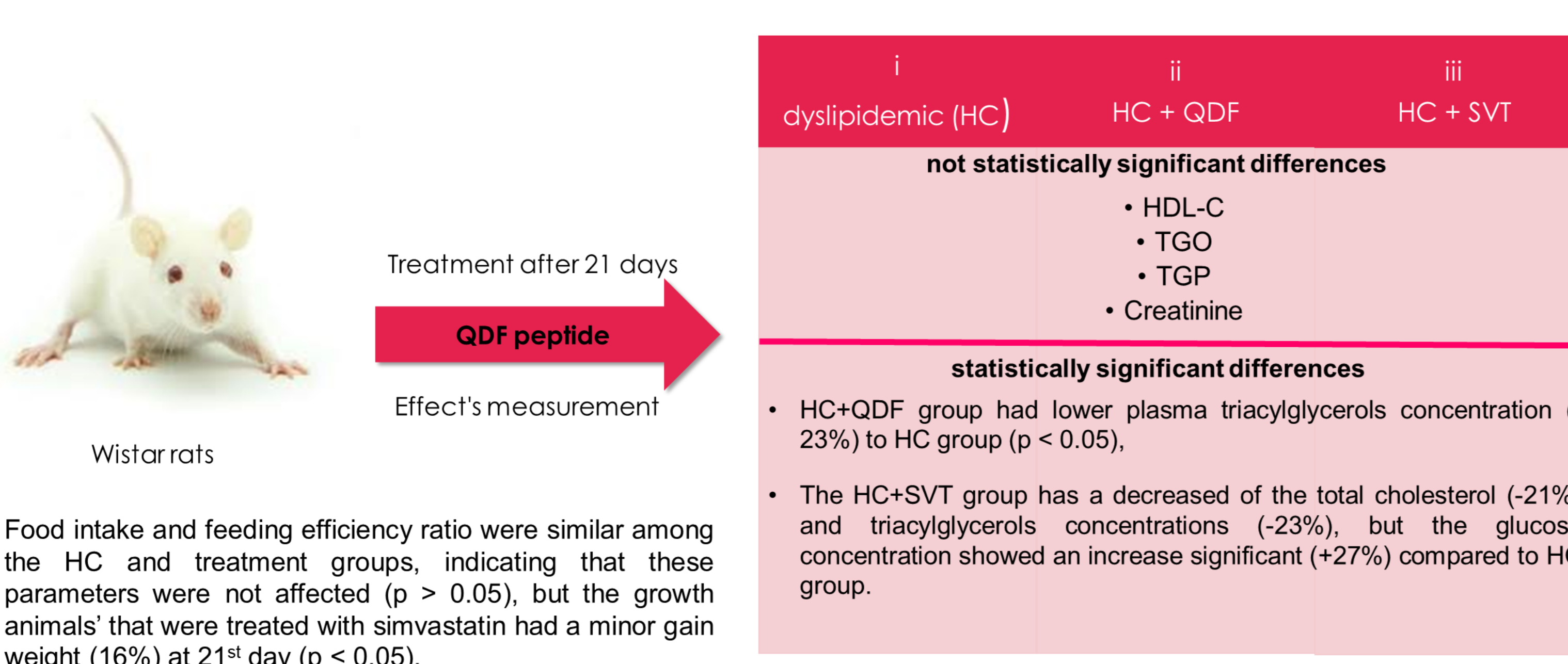


Figure 1. Weight growth (A), Feed intake (B), Total Cholesterol (C), Triacylglycerides (D), HDL cholesterol (E) and glucose from animals (*Rattus norvegicus*) depending on the days of analysis. Being the HC group: animals on HC diet that did not receive treatment, HC + QDF group: animals on HC diet treated with peptide QDF and HC + SVT: animals on HC diet treated with the reference drug Simvastatin.

CONCLUSION

The oral daily administration of QDF peptide promoted the reduction of triglycerides in the plasma but did not show an effect on glucose concentration in rats fed a rich-fat and sugar diet.

ACKNOWLEDGEMENTS

REFERENCES

- NAGAOKA, S. Structure-function properties of hypolipidemic peptides. *Journal of Food Biochemistry*, v. 43, p. 1–8, 2019.
- WORLD HEALTH ORGANIZATION (WHO). Time to deliver: report of the WHO Independent High-Level Commission on Noncommunicable Diseases. Ed. **World Health Organization**, 2018.
- WIGGINS, B. S.; DIXON, D.; BELLONE, J.; *et al.* Key articles and guidelines in the management of dyslipidemia: 2019 update. *Journal of pharmacy practice*, v. 33, p. 882-894, 2020.
- ALENGHAT, F. J.; DAVIS, A. M. Management of blood cholesterol. *Jama*, v. 321, p. 800-801, 2019.
- FERREIRA, E. S.; AMARAL, A. L. S.; CAPRARO, J. *et al.* Hypocholesterolemic effect of rat-administered oral doses of the isolated 7S globulins from cowpeas and adzuki beans. *Journal of Nutritional Science*. v. 4, 2015.
- SILVA, M. B. C.; SOUZA, C. A. C.; PHILADELPHO, B. O. *et al.* In vitro and in silico studies of 3-hydroxy-3-methyl-glutaryl coenzyme A reductase inhibitory activity of the cowpea Gln-Asp-Phe peptide. *Food chemistry*, v. 259, p. 270-277, 2018.