

ATR-FTIR as a high throughput tool for quick screening of lipolysis in 3T3-L1 adipocytes

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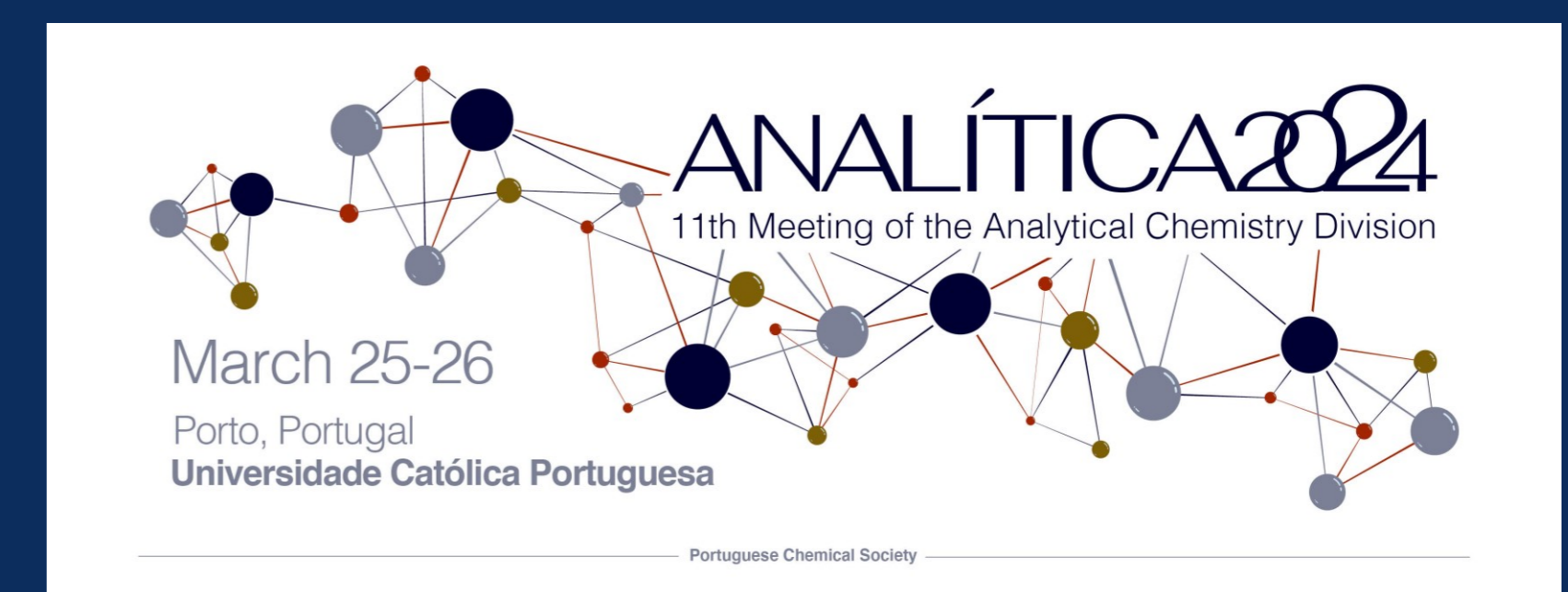


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Introduction

Lipolysis is an important biological process responsible for delivering fatty acids appropriately to meet energy needs. An unbalanced amount of free fatty acids is associated with insulin resistance and an increase in triglyceride levels. This process is related to the degradation of triglycerides in differentiated adipocytes. Typically, the rate of lipolysis in adipocytes is measured using commercial kits (for triglyceride quantification or glycerol release), or by assessing the mRNA levels of lipases and regulatory proteins, and in some cases, by chromatographic techniques to quantify free fatty acids. Both techniques are time-consuming and expensive, which can be a disadvantage in the search for new compounds to reduce fat accumulation in adipose tissue. Therefore, Fourier transform infrared spectroscopy (FTIR) can be a valuable tool for measuring lipolysis due to its ease of operation, rapid analysis time, and low cost.

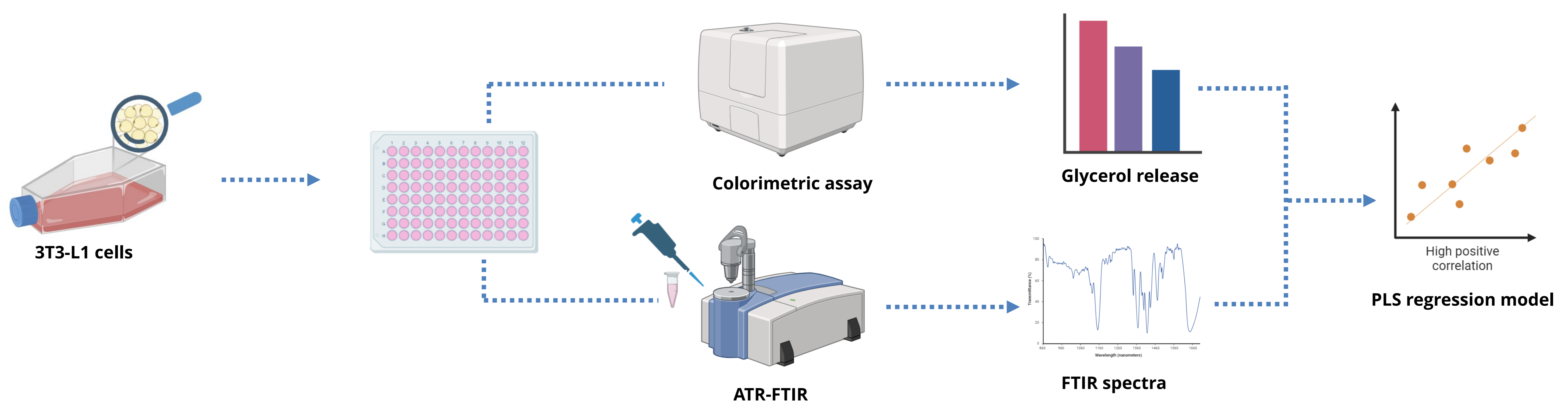
Objectives

Impact of *Tenebrio molitor* on lipolysis

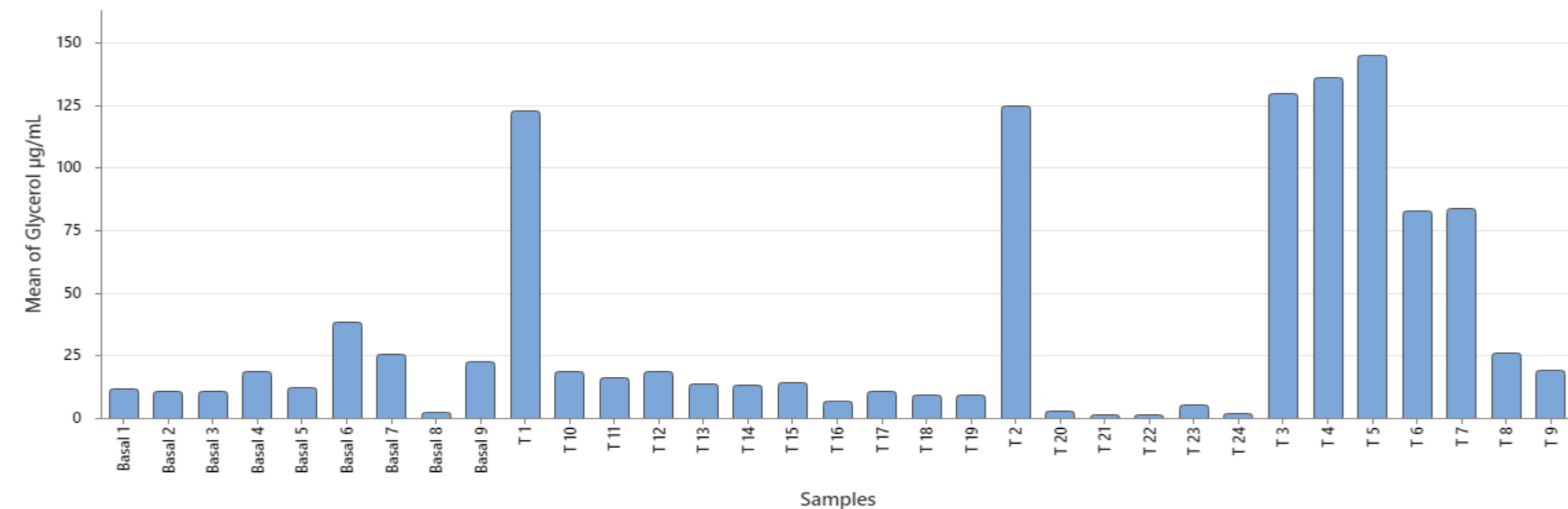
Glycerol release estimation by FTIR

Create a prediction model

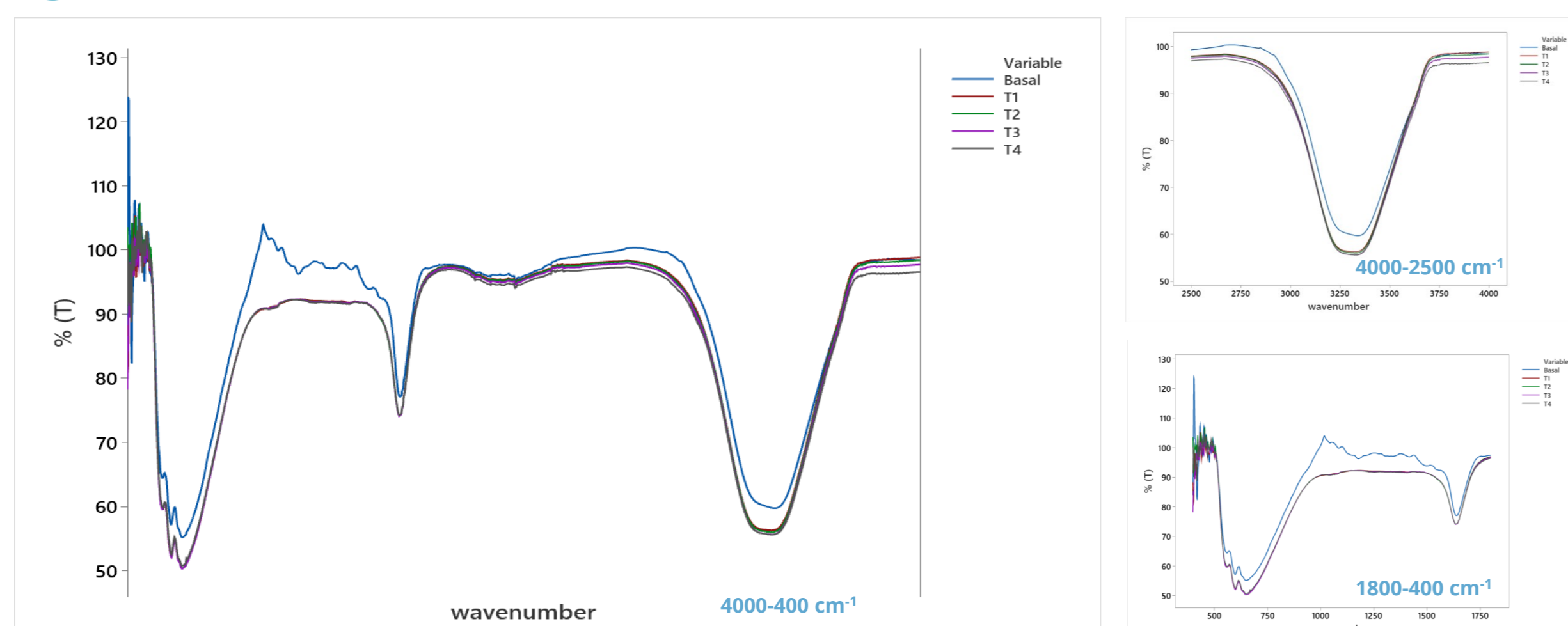
Methods



Lipolysis (glycerol release)

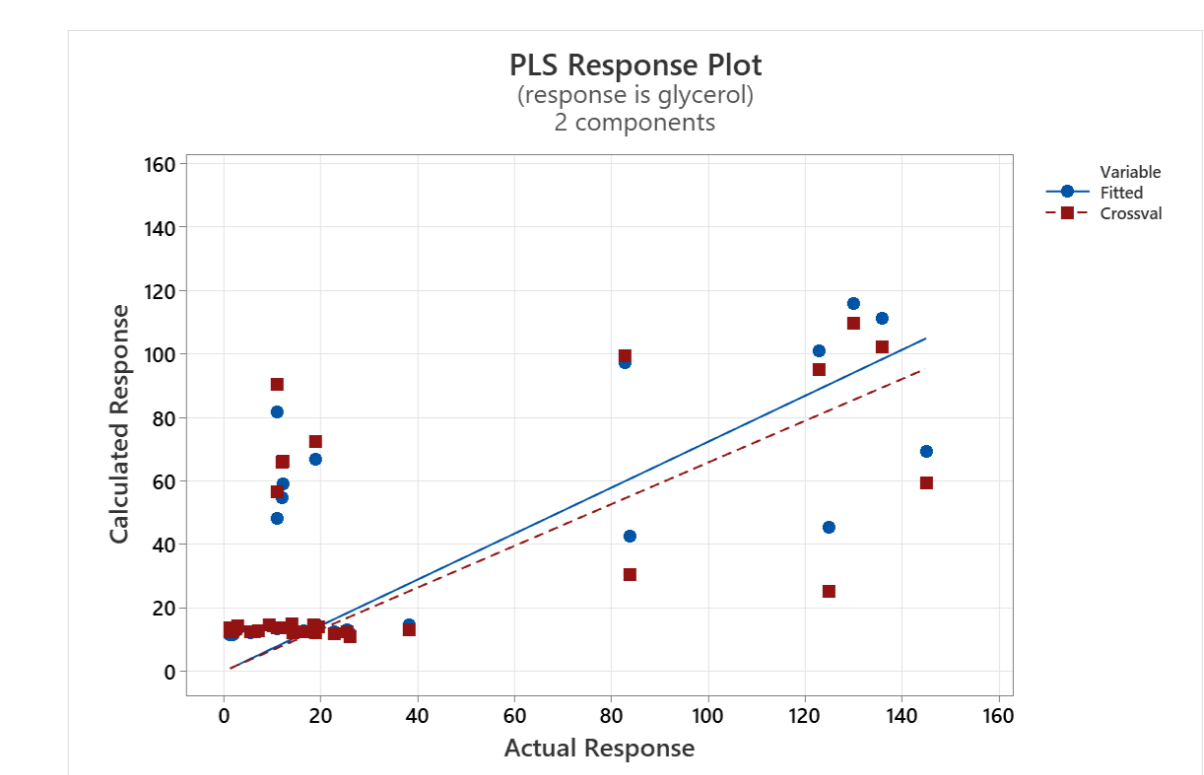
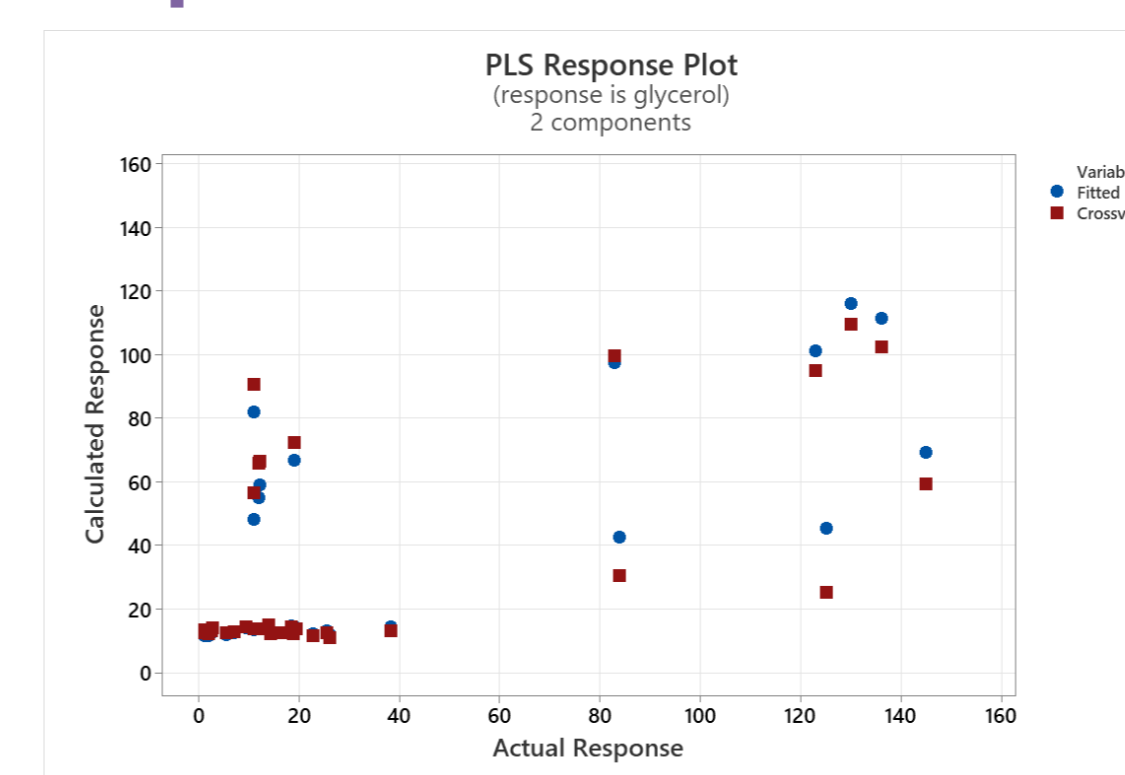


ATR-FTIR spectra

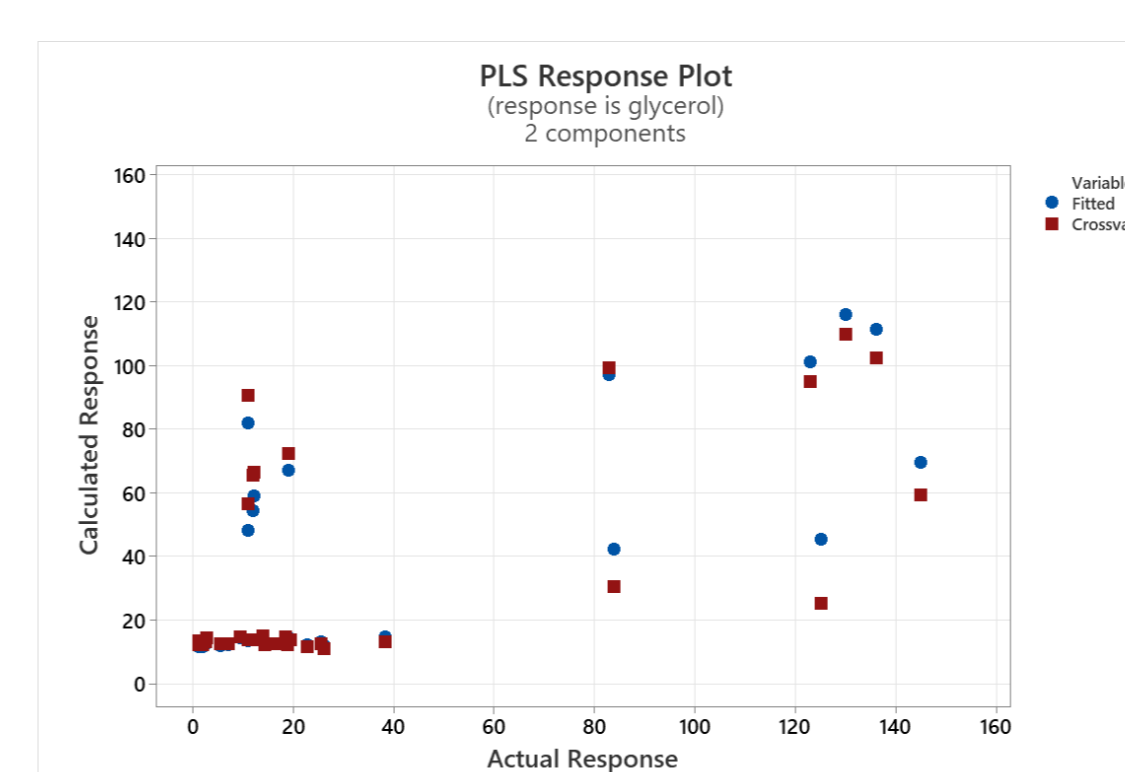


Prediction model

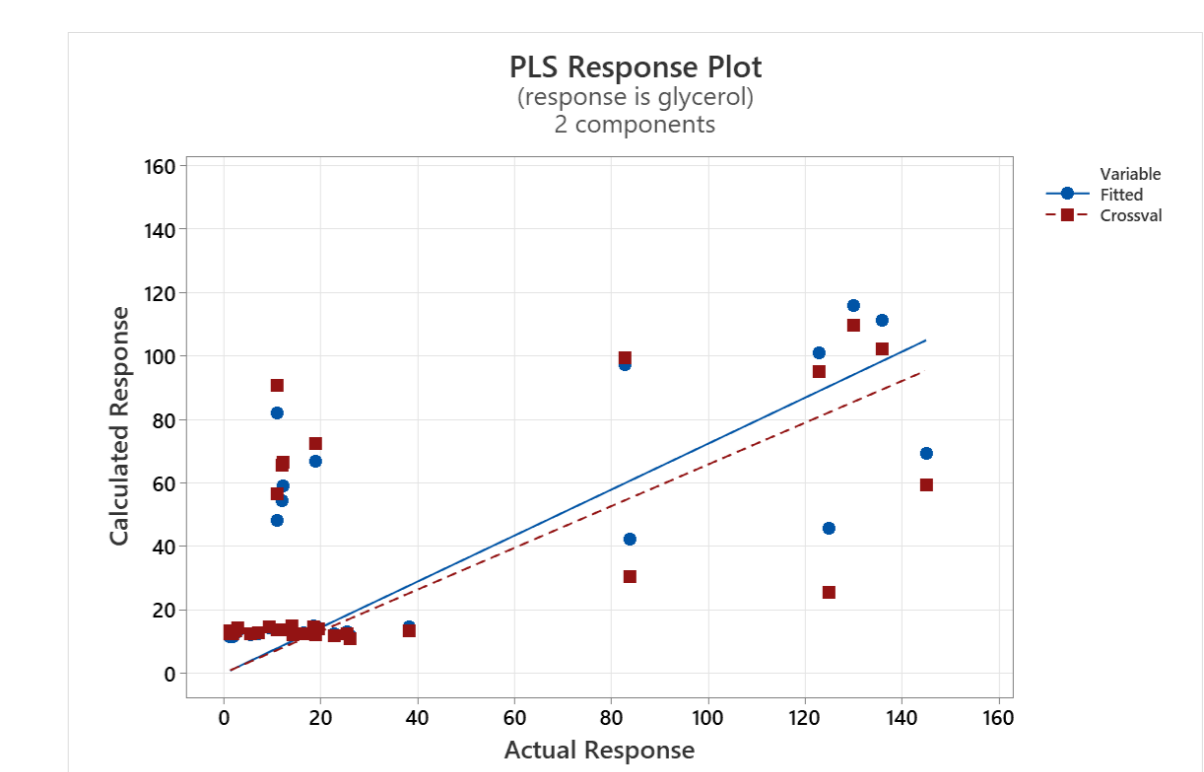
All Spectra



Selected Regions



$R^2 > 0.6$



Conclusions

Cells treated with *Tenebrio molitor* showed high lipolysis rate.

The applied methodology showed high potential for determining the lipolysis rate.

Acknowledgements

This research was funded by Pacto da Bioeconomia Azul Projeto nº C644915664-00000026 – Vertical FOOD – WP4 and Fundação para a Ciência e a Tecnologia through the grant number UIDB/50016/2020. Additionally, author E.M.C. would like to acknowledge Fundação para a Ciência e Tecnologia for his funding under the Scientific Employment Stimulus—Individual Call, DOI: 10.54499/2022.07206.CEECIND/CP1745/CT0003.

