

Impact of vegetable oils on *Lactiseibacillus rhamnosus* and *Bifidobacterium animalis* subsp. *lactis* growth

Manuela Machado, Sérgio Sousa, Luís M. Rodríguez-Alcalá, Ana Maria Gomes, Manuela Pintado

Universidade Católica Portuguesa, CBQF Centro de Biotecnologia e Química Fina-Laboratório Associado, Escola Superior de Biotecnologia, Rua Diogo Botelho 1327, 4169-005 Porto, Portugal

Introduction

Studies on bioactive lipids have been increasing in the last years due to their proven health benefits: positive impact on the prevention of cardiovascular disorders, on the development of cognitive function, and more recently on the control of body weight and diabetes. Consequently, the feasibility of their incorporation in new functional products has gained a greater interest in the food industry. Alongside the technological challenges, the antimicrobial activity of some of these oils may constitute a potential barrier for their incorporation, for example in fermented foods. Taking this into consideration, the aim of this work was the evaluation of the impact of pomegranate, coconut, and avocado vegetable oils on *Lactiseibacillus rhamnosus* and *Bifidobacterium animalis* subsp. *lactis* Bb12 growth.

Material and Methods

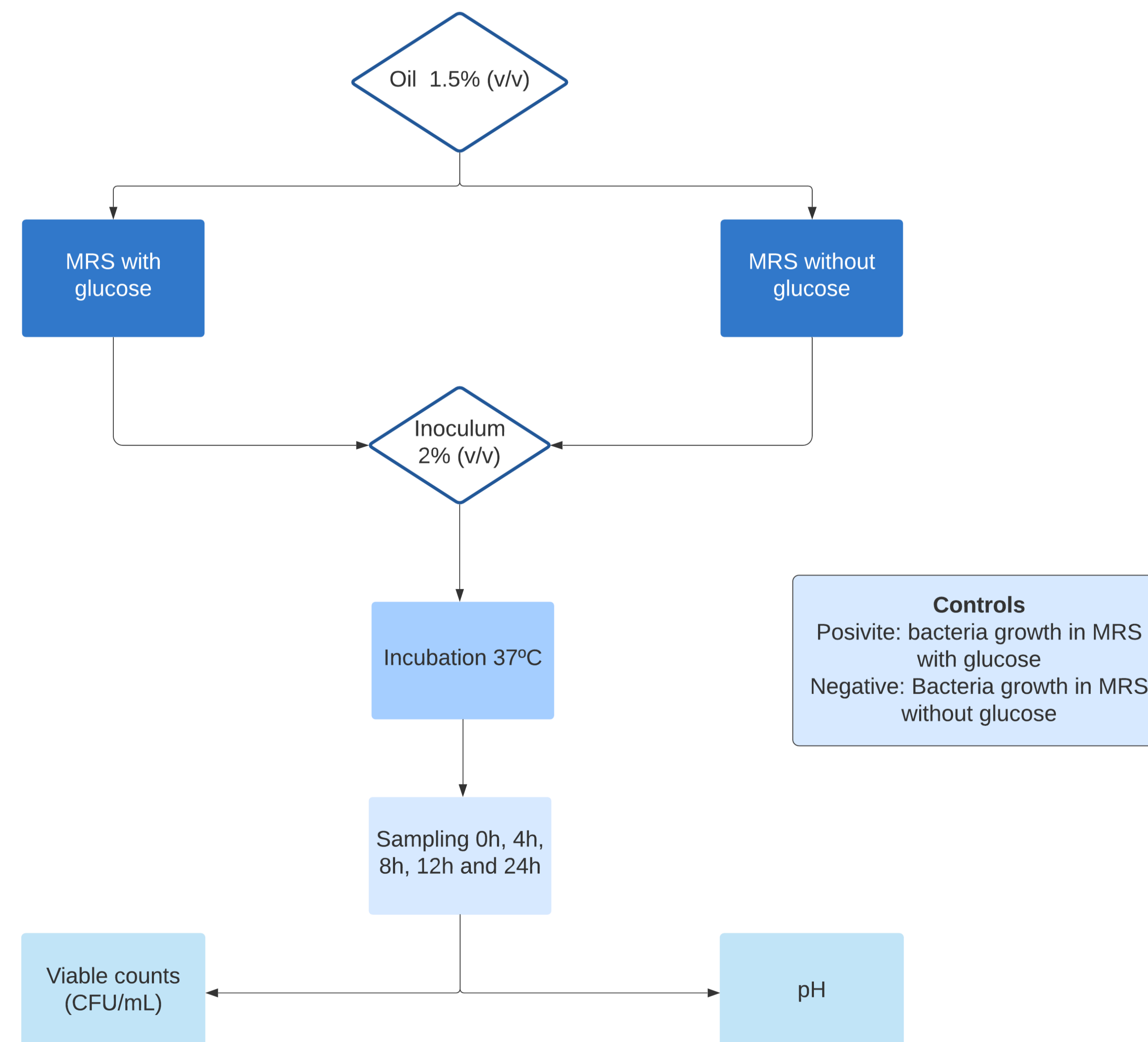
Samples & Microorganisms

Vegetable oils: avocado, coconut and pomegranate oils

Microorganisms: *Lactiseibacillus rhamnosus* R11 and *Bifidobacterium animalis* subsp. *lactis* Bb12

Media: MRS broth with 2% (w/v) and without glucose. In the case of *B. animalis* MRS medium was supplemented with 0.5 g/L of L-cysteine

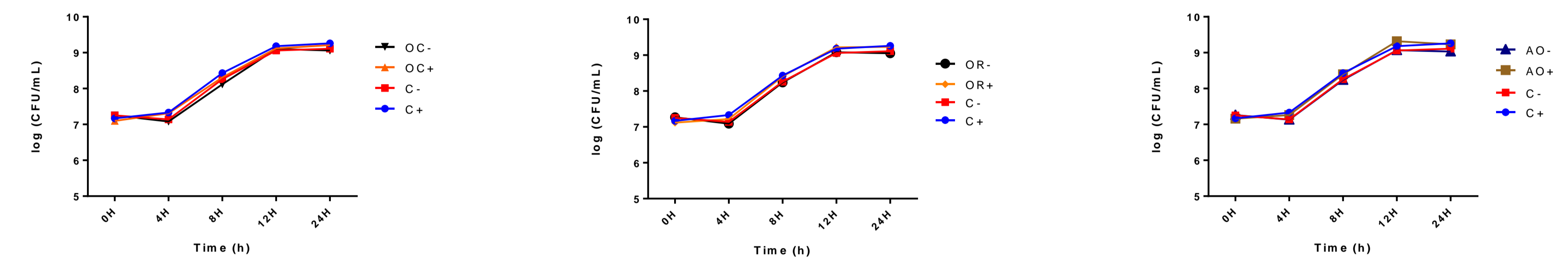
Procedure:



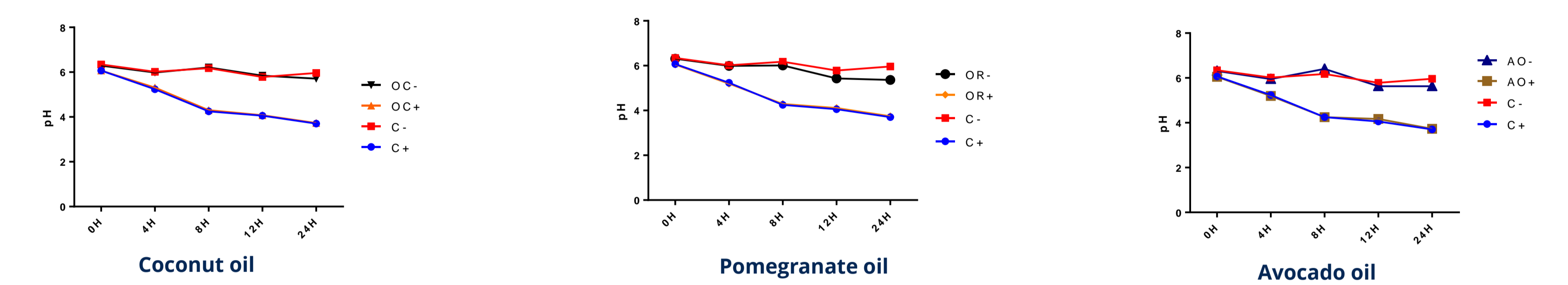
Results

Lactiseibacillus rhamnosus R11

Growth curves in MRS

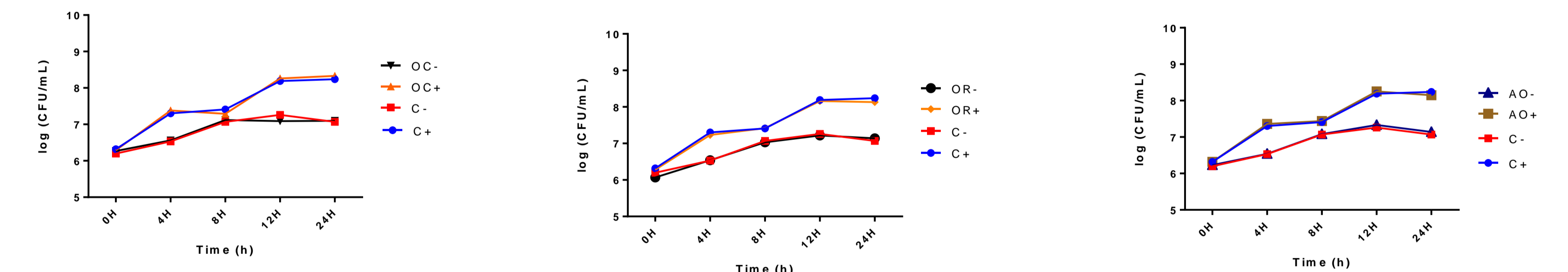


Variation of the pH

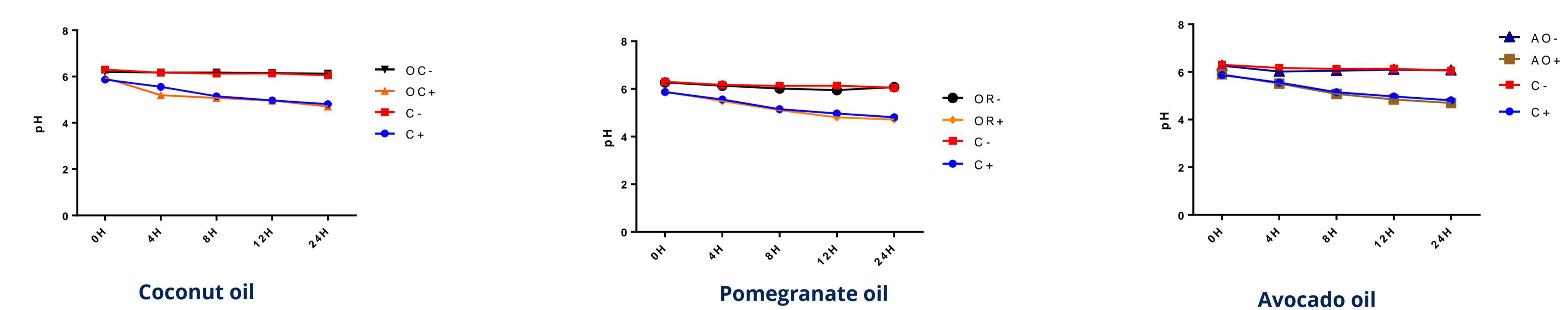


Bifidobacterium animalis subsp. *lactis* Bb12

Growth curves in MRS



Variation of the pH



Conclusions

The presence of each of the three vegetable oils did not affect the bacterial growth. Viable cell numbers reached 9.2 log CFU/mL and 8.1 log CFU/mL upon 24 h of incubation for *L. rhamnosus* and *B. animalis* Bb12, respectively. For both bacteria, the presence of either avocado or coconut oil appears to improve microbial growth. For *L. rhamnosus* the presence of vegetable oils led to a lower pH than that of the control after 24 h of incubation.

Acknowledgements

This work was supported by National Funds from FCT - Fundação para a Ciência e a Tecnologia through project UIDB/50016/2020. Manuela Machado is grateful for the financial support from FCT through the Doctoral grant reference SFRH/BD/136701/2018.