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Prebiotic metabolism of selected autochthonous lactic acid bacteria isolated from a Portuguese artisanal cheese

GRUPO SERPAFLORA OPERACIONAL

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INTRODUCTION

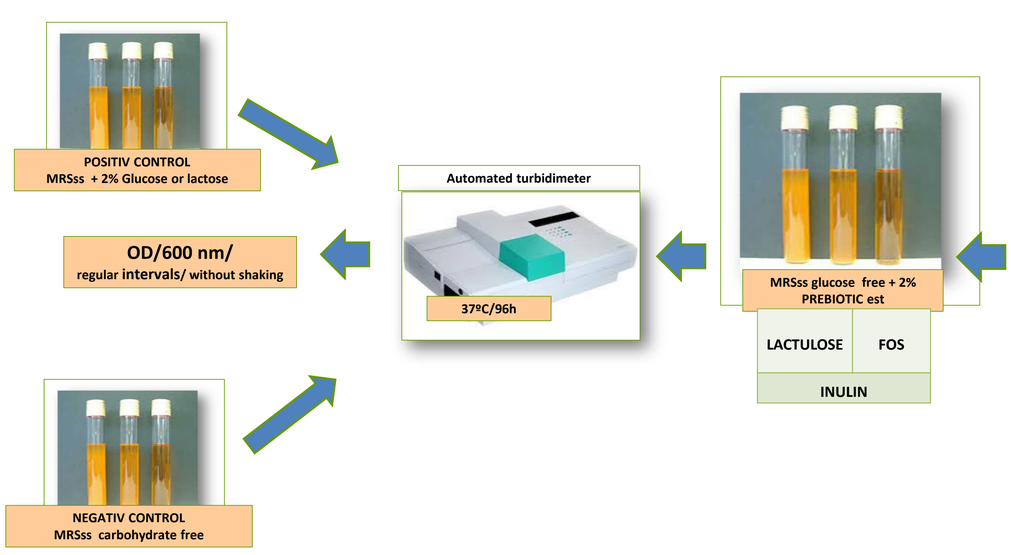
Today's growing interest in nutrition interventions to improve health has led to an increased interest and demand for functional food in the markets mainly in developed countries[1]. Fermented food is an excellent environment for the survival of beneficial microorganisms and may contain important levels of viable microbes, mainly Lactic Acid Bacteria (LAB), that can exert beneficial influence on human health[2]. The beneficial effects of BAL can be associated with their development and/or with the production of certain metabolites, in the gut or in foods, which can be affected by different conditions. One factor that affect the growth of LAB is the presence of prebiotics which are defined as "non-digestible food ingredients that beneficially affects the host by selectively stimulating the growth and/or activity of bacteria in the colon and thus improves host health"[3]. Thus, growth in prebiotics is considered a positive feature for LAB. The end-products of carbohydrate metabolism, including fermentation of non-digestible carbohydrates with prebiotic function by LAB, are organic acids, ethanol, and gases. Among these, short-chain fatty acids (SCFA) display distinct positive physiological effects on the host. Butyric acid has been the most widely studied for its anti-carcinogenic and anti-inflammatory effects, although acetic and propionic acid also exhibit health-promoting effects[4,5]. Fermented artisanal foods are gaining popularity and have even been proposed as part of dietary recommendations[6]. Fermented dairy products have been by far the most investigated as a source of benefic microrganisms and how to carry them efficiently through gastro-intestinal tract[7]. Among them, cheese is an excellent matrix that favour the survival of LAB through gastrointestinal transit due to its specific physical and chemical characteristics such as pH, high fat content, nutrient availability and low oxygen content[8].

OBJECTIVE

Serpa is a Protected Designation of Origin (PDO)[9] soft-cheese produced within the Alentejo province, in the south of Portugal. Its quality and specific characteristics come mainly from the endogenous microbiota, the main one being the BAL group with viable counts around 10^8 cfu/g at the end of the ripening process[10,11]. In this context, this study aimed to evaluate prebiotic metabolism and its influence on the production of SCFA of pre-selected autochthonous LAB isolated from artisanal Serpa cheese, for potential application during manufacturing process.

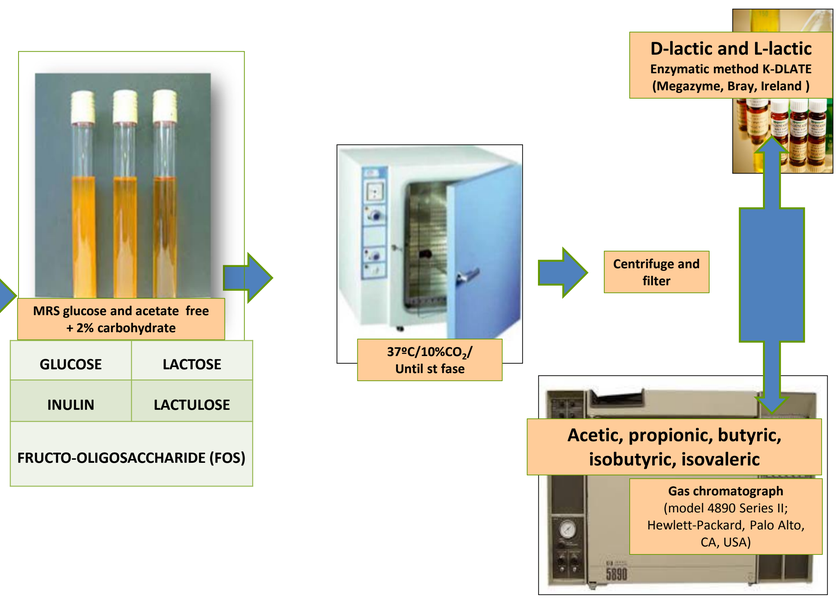
MATERIAL AND METHODS

MATERIAL AND METHODS - GROWTH ON PREBIOTIC

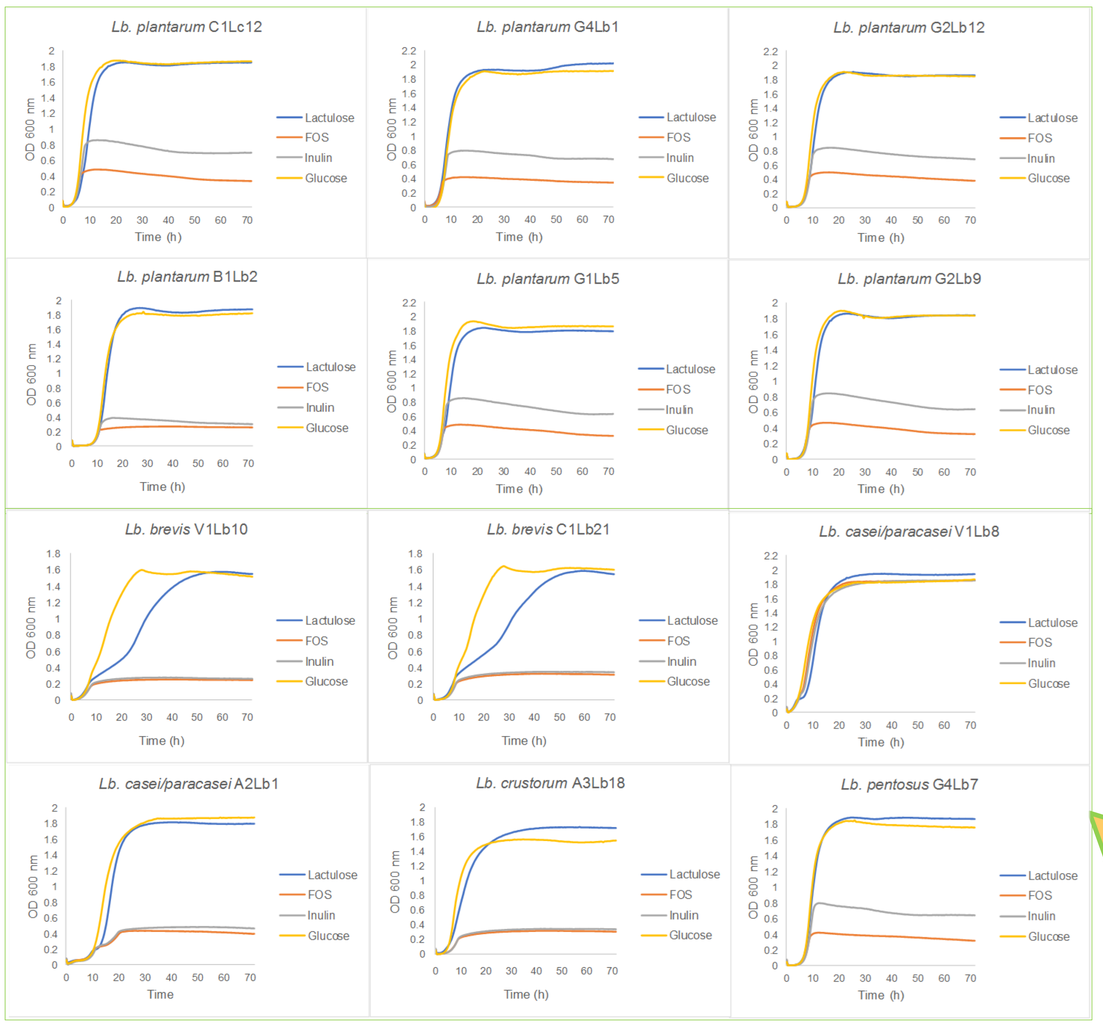


Serpa cheese LAB isolates	Strains selected
Lactobacillus casei/paracasei	V1Lb8, A2Lb1
Lactobacillus plantarum	G4Lb1, G2Lb12, B1Lb2, G1Lb5, G2Lb9, C1Lc12
Lactobacillus brevis	V1Lb10, C1Lb21
Lactobacillus crustorum	A3Lb18
Lactobacillus pentosus	G4Lb7

MATERIAL AND METHODS - SHORT-CHAIN FATTY ACID (SCFA) PRODUCTION



RESULTS - GROWTH ON PREBIOTIC



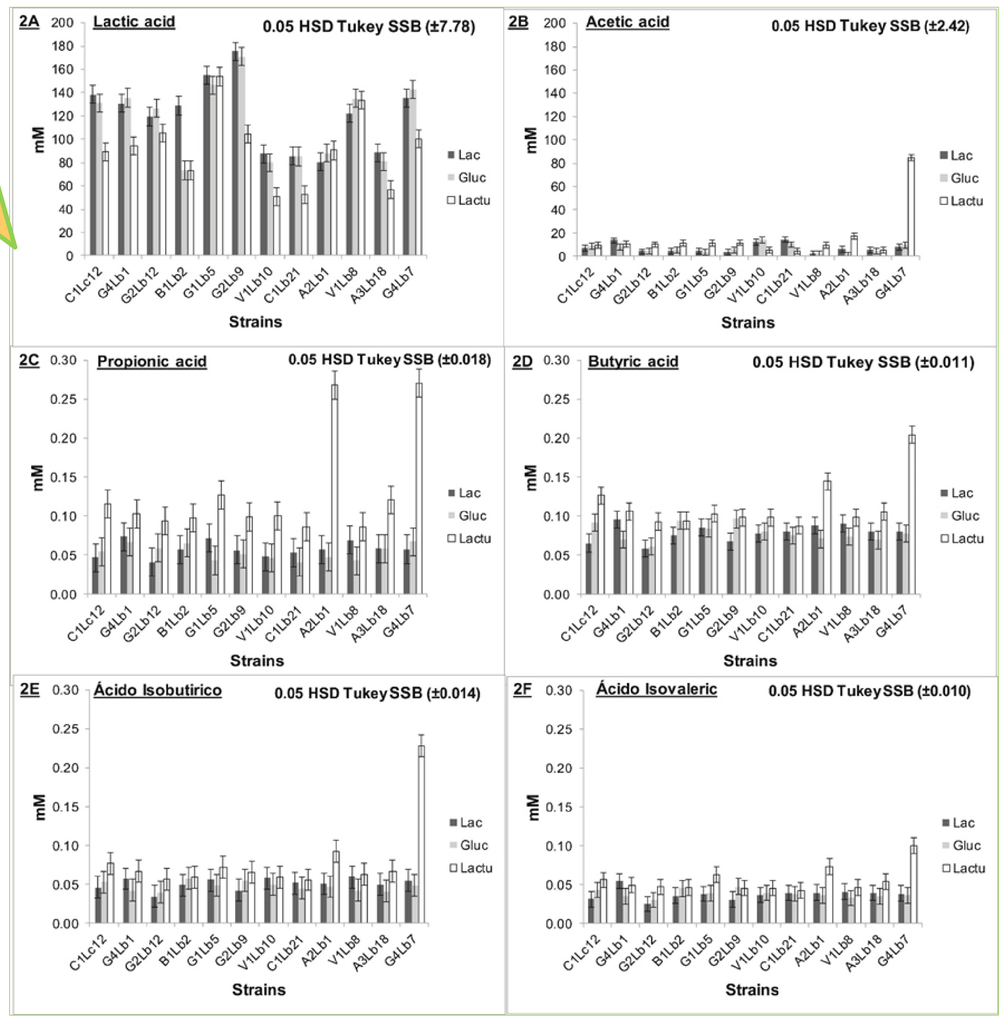
CONCLUSIONS

The fermentation of prebiotics showed **that lactulose supported better growth of lactobacilli and induced the production of short-chain fatty acids (SCFA)**

CONCLUSIONS

Lactulose was the most effective prebiotic for supporting bacterial growth followed by inulin and FOS

RESULTS - SHORT-CHAIN FATTY ACID (SCFA) PRODUCTION



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