

# Tomato marc's impact upon probiotic organism's survival: An alternative functional ingredient for fermented products

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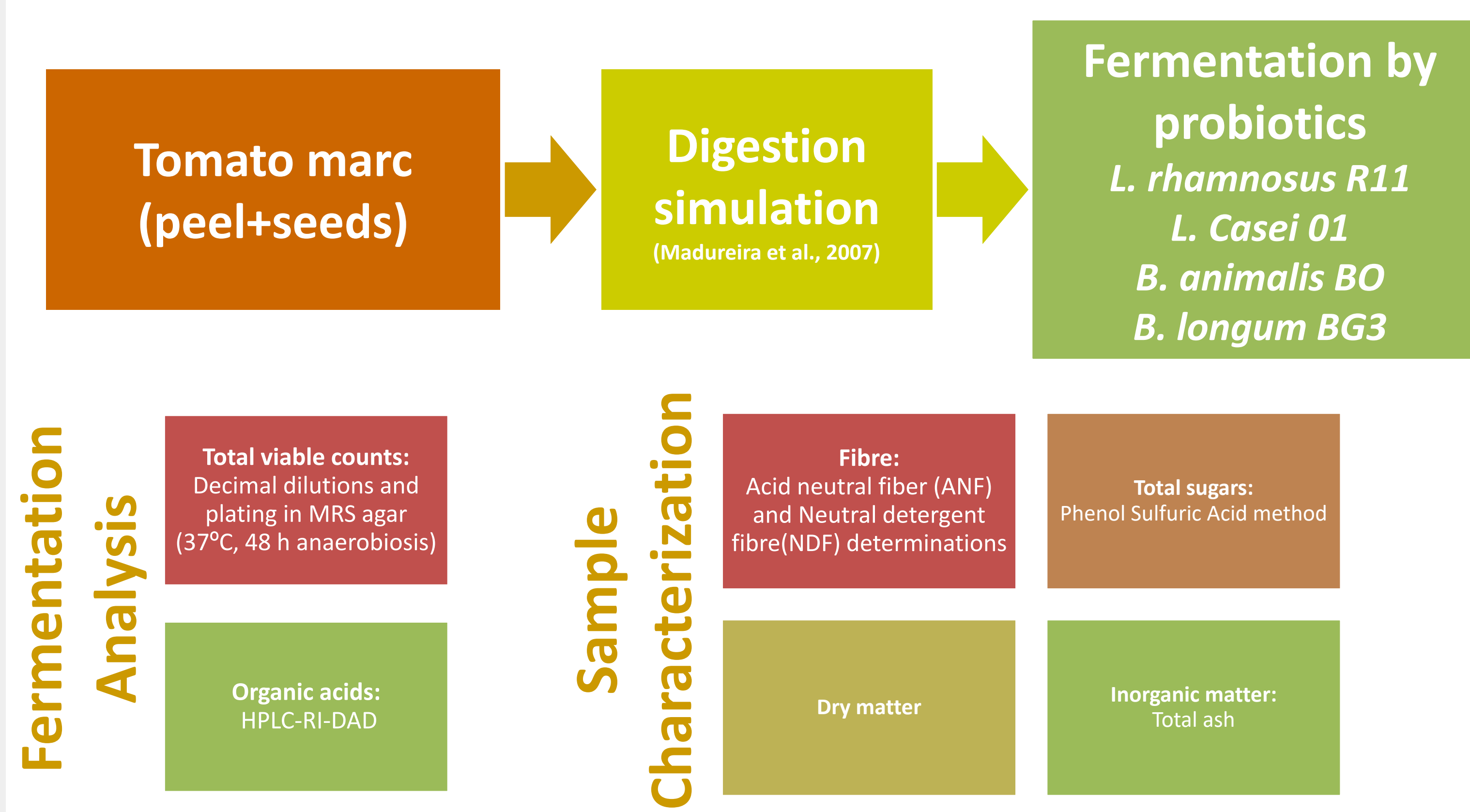
PORTO

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## Abstract

The consumption of dietary fiber (non-digestible carbohydrates that may be used as a carbon source by microorganisms) has been shown to play an important role in the modulation of gut microbiota, inducing not only changes in its microbial composition but also changing the profile of metabolites produced by it. Tomato is one of the most widely consumed fruits. Besides being consumed fresh, there are several industries that focus on the transformation of tomato into several other products (e.g. canned tomato, tomato pulp or ketchup) yielding the tomato peel and seeds (here referred to as tomato marc), as a by-product. The castaway tomato marc presents itself as an interesting source of bioactive materials such as carotenes and fibers, which in turn may allow for the valorisation of this product. Moreover, as this residue is comprised, in ca. 56%, of fibres, it is interesting to contemplate its usage as a food additive to matrices with a low fiber content. Therefore, the present work aimed to evaluate the impact of dry tomato marc upon 4 commercially available probiotic microorganisms (*Lactobacillus rhamnosus* R11, *Lactobacillus plantarum* 299v, *Bifidobacterium animalis* Bo and *Bifidobacterium longum* BG3) while also contextualizing with the digestive process and evaluating if the impact of the removal of some bioactive constituents (phenolic compounds and carotenoids).

## Materials and Methods



	Mean ± SD (per 100 g)
Dry matter	59.086 ± 0.860
Ash	1.313 ± 0.194
AFN	32.48 ± 0.38
NDF	23.59 ± 0.09
Total sugar content	2.50 ± 0.01

## Conclusions

- The presence of digested tomato marc has no significant impact on the survival of *L. rhamnosus* or *B. longum*
- The presence of digested tomato marc has a significant, positive, impact upon the survival of *L. casei* and *B. animalis*
- Digested tomato marc appears to affect the production of organic acids, with propionic acid production increasing from most of the probiotics

## Conclusions

## Results

### Effect on bacterial survival

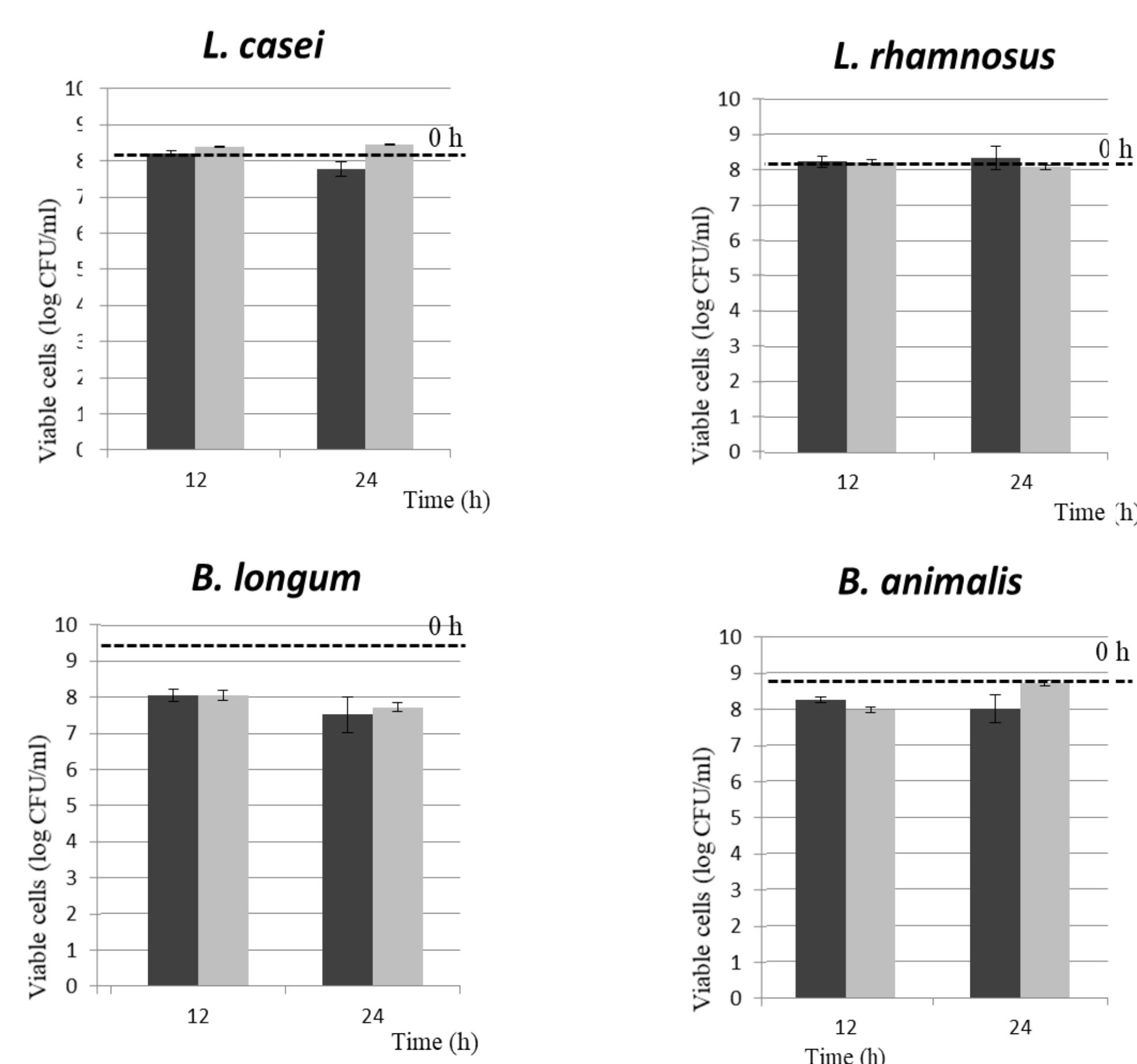


Figure 1. Effect of 2% (w/v) digested tomato marc on the growth of individual probiotics. ■ control ■ digested tomato marc

### Effect on organic acid production

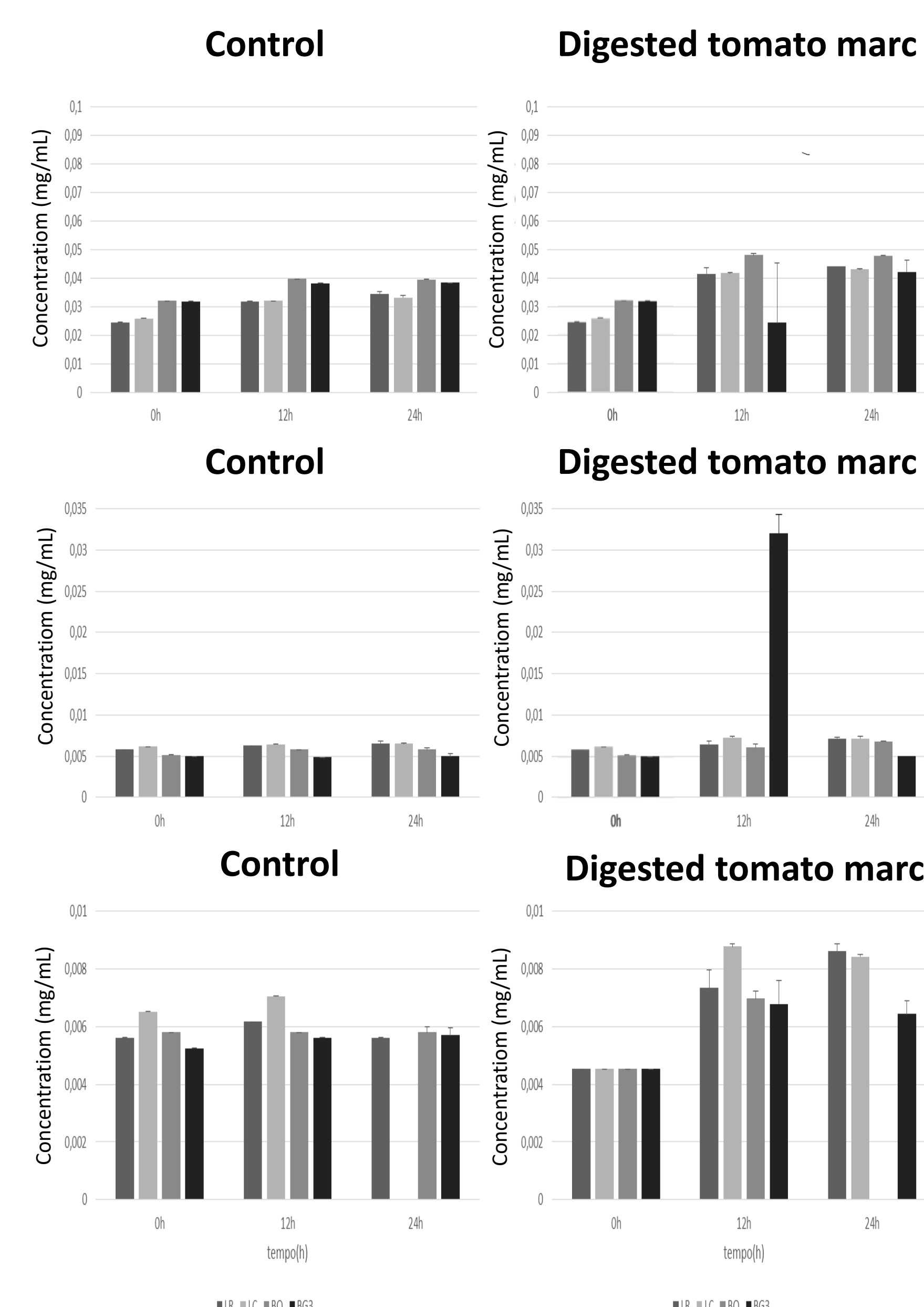


Figure 2. Effect of 2% (w/v) digested tomato marc on probiotic's production of organic acids. ■ *L. rhamnosus* ■ *L. casei* ■ *B. animalis* ■ *B. longum*