

International Conference on

## APPLIED MICROBIOLOGY AND MICROBIAL BIOTECHNOLOGY &

International Conference on

## MICROBIOME R&D AND BIOSIMULANTS &

3<sup>rd</sup> International Conference on

## INTERNAL MEDICINE & HOSPITAL MEDICINE

October 15-16, 2018 Ottawa, Canada

### Propionic acid production in cheese whey fermentation by a mixed culture of *Propionibacterium freundenreichii* subsp ATCC 6207 and *Lactobacillus paracasei*

Jose Guilherme Lembi Ferreira Alves  
Federal University of Lavras, Brazil

Propionic acid is used as an animal nutrition additive, food preservative and in the manufacture of cellulose-based plastics, herbicides, and perfumes. Propionic acid production was investigated using concentrated whey from fresh cheese as the source of carbon for *P. freundenreichii* subsp ATCC 6207 and *L. paracasei* mixed culture. A rotational central composite design (RCCD) was carried out with 17 essays, with 3 independent variables (concentration of *L. paracasei* inoculum, lactose and calcium carbonate concentrations) and as response variables propionic acid (PA), acetic acid and lactic acid, concentrations, determined by High-Performance Liquid Chromatography, in addition to lactose consumption, cell counts, total acidity and pH. The concentrated whey media were sterilized and inoculated with 10% vv-1 *P. freundenreichii*. The fermentations were conducted in erlenmeyers in an incubator at 30°C without stirring. In the best essay PA production was 23.27g L<sup>-1</sup>, with sugar consumption of 42.17g.L<sup>-1</sup> after 120h. The cell growth in this assay was 3 log cycles (from 10<sup>6</sup> to 10<sup>9</sup> CFU mL<sup>-1</sup>). The three treatments with the highest titratable acidity varied, on average, from 0.62 to 16.09g L<sup>-1</sup> during the fermentation, while the mean pH variation of the media was from 7.12 to 4.54. It was found that the highest yields of PA occurred with values below 40g L<sup>-1</sup> of lactose and above 25g L<sup>-1</sup> of calcium carbonate in the medium. The concentration of *Lactobacillus* inoculum had no influence on the process and the addition of carbonate favored the production of propionic acid.

#### Biography

Jose Guilherme Lembi F. Alves is bachelor's at Chemical Engineering from Federal University of Lavras Minas Gerais (1992) in Belo Horizonte//Brazil, master's in Food Engineering at Estadual University of Campinas (1996) and Doctor in Food Engineering at Estadual University of Campinas (2003), in Campinas/Brazil. He is currently Professor Associate II at Federal University of Lavras (UFLA). He has experience in Food Engineering, acting on the following subjects: industrial fermentations; optimization of fermentative processes; purification of biological products using Liquid-liquid extraction. He has published 20 papers in reputed journals and has been serving as an editorial board member of reputed journals.

jlembi@dca.ufla.br

#### Notes: