

Screening of lactic acid bacteria based on their reduction kinetics

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Lactic Acid bacteria (LAB) are important microorganisms in food industry for the manufacture of fermented food products and as probiotics. They have ability to reduce redox potential (E_h) of food matrices, influencing oxidation-reduction reactions involved in the organoleptic quality of the product and also preventing the development of undesired microflora.

Amongst LAB, some species have the ability to reduce E_h below negative values while others do not ^[1]. For E_h measurement, the most common method is using redox probe in a liquid medium or food matrix ^[2]. Cachon *et al.* (2002) proposed an accurate method based on monitoring of reduction kinetic vs. time and allowing to compare LAB according to their maximum reduction rate and time to reach this one. However, for screening a lot of strains, the method using redox probe protocol is complex, time-consuming and expensive.

The development of a discriminant method to pre-evaluate and compare the redox potential of a bank of LABs would save time.

Michelon *et al.* (2013) proposed an agar milk screening using colored oxidation-reduction indicators to quickly categorize, with a reducing power score, a large number of LAB strains. This method was used successfully for screening a bank of mutants or a bank of LAB strains. However, while this screening method showed significant inter-species differences, it was difficult to identify intra-species ones ^[3].

In order to differentiate several strains belonging to the same species, we developed a new method combining reduction capacity comparison and reduction kinetics with high throughput screening. This method was applied on LAB starters.

^[1] Brasca, M., Morandi, S., Lodi, R., Tamburini, A., 2007. J Appl Microbiol 103, 1516–1524.

^[2] Cachon, R., Jeanson, S., Aldarf, M., Divies, C., 2002. Lait 82, 281–288.

^[3] Michelon, D., Tachon, S., Ebel, B., De Coninck, J., Feron, G., Gervais, P., Yvon, M., Cachon, R., 2013. J Biosci Bioeng 115, 229–232.