



## Enzymatic activity measurements in *Streptococcus thermophilus*

Department of Food Science and Microbiology (Di.S.T.A.M),  
University of Milan - Italy

### CONTEXT

*Streptococcus thermophilus* is a major component of dairy starter cultures used for the manufacture of yoghurt and cheese.

In this study,  $\beta$ -galactosidase and lactate dehydrogenase activities were measured in *Streptococcus thermophilus* cells to evaluate the effect of carbon dioxide availability on the homolactic fermentation process<sup>1</sup>.

### MATERIAL

- Precellys<sup>®</sup>24
- Precellys<sup>®</sup> kit: 03961-1-004 (glass beads 0.5 mm)
- Sample: Concentrated *S. thermophilus* cells washed
- Buffer: 50mM tris/HCl buffer, pH7.

### PROTOCOL

- Precellys<sup>®</sup>24: 6800 rpm, 3 x 30 sec (30 sec break) in cold room or using Cryolys cooling option.
- Centrifugation: 15.000 xg, 10 min, +4°C.
- Analysis: Protein content within total cell extract by Bradford method /  $\beta$ -galactosidase and lactate dehydrogenase activities measured spectrophotometrically<sup>1</sup>.

1) S.Arioli et al., Microbiology 155 (2009), 1953-1965; DOI 10.1099/mic.0.024737-0

### RESULTS

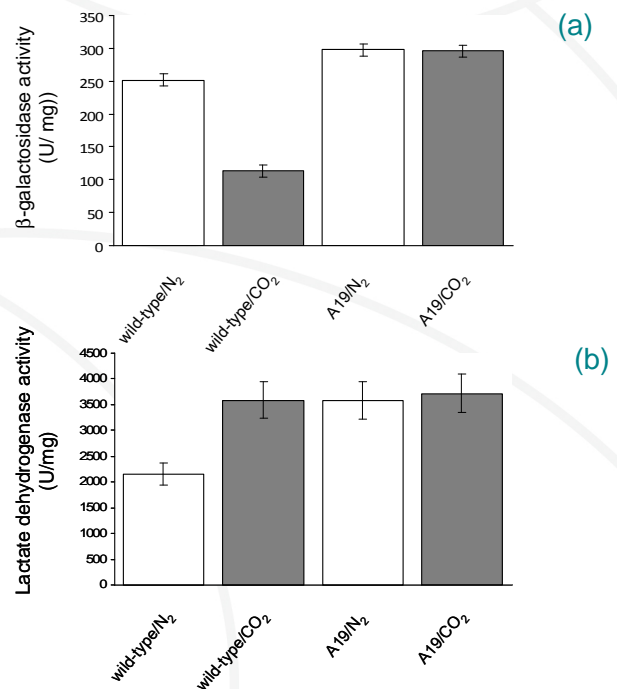


Figure 1:  $\beta$ -galactosidase (a) and lactate dehydrogenase (b) activities of *S. thermophilus* wild-type cells (white bars) and A19( $\Delta$ pcc; $\Delta$ carB) mutant cells (grey bars) grown in enriched CO<sub>2</sub> or N<sub>2</sub> atmosphere.

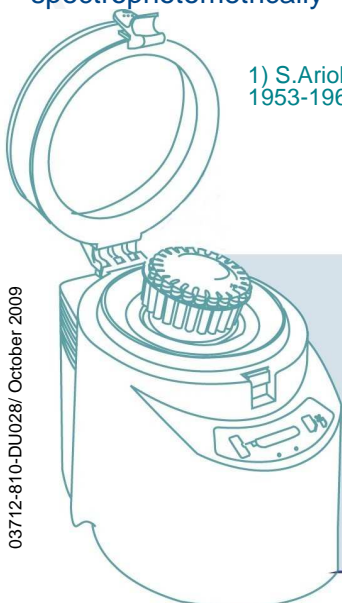
Our results originally show a direct correlation between the distribution of the HPr phosphorylated isoforms and the measured level of  $\beta$ -galactosidase and lactate dehydrogenase activities (Fig. 1) and its relevance in milk acidification process.

### CONCLUSION

Comparing to the former classical method of bacterial cell disruption, the use of **Precellys<sup>®</sup>24** allows a perfect homogenization of the samples. Precellys<sup>®</sup>24 is easy to use, simple, efficient and much faster than the former method. The small dimension of Precellys<sup>®</sup>24 allow its location in a cold room thus preserving the activities of the overall enzymatic cell machinery.

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Problem



Solution

