

# Malolactic starter performance during co-fermentation with SO<sub>2</sub>-producing yeast: early, transient acetaldehyde formation is a key regulator

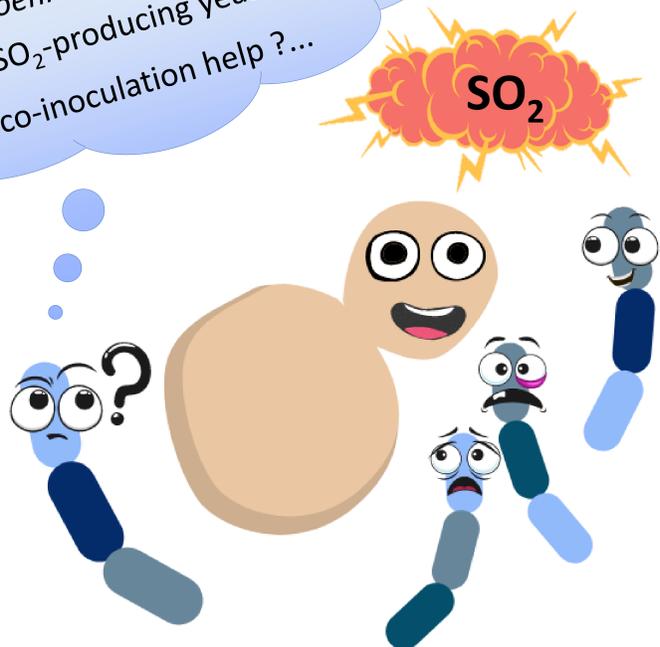
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Peter Costello<sup>1</sup>, Radka Kolouchova<sup>1</sup>, Jane McCarthy<sup>1</sup>, Charlotte Jordans<sup>1</sup>, Simon Schmidt<sup>1</sup>

<sup>1</sup>The Australian Wine Research Institute, PO Box 197, Glen Osmond (Adelaide) SA 5064, Australia

Corresponding author's email: peter.costello@awri.com.au

Can *O. oeni* ever survive with high SO<sub>2</sub>-producing yeast?  
Can co-inoculation help?...



## Methods

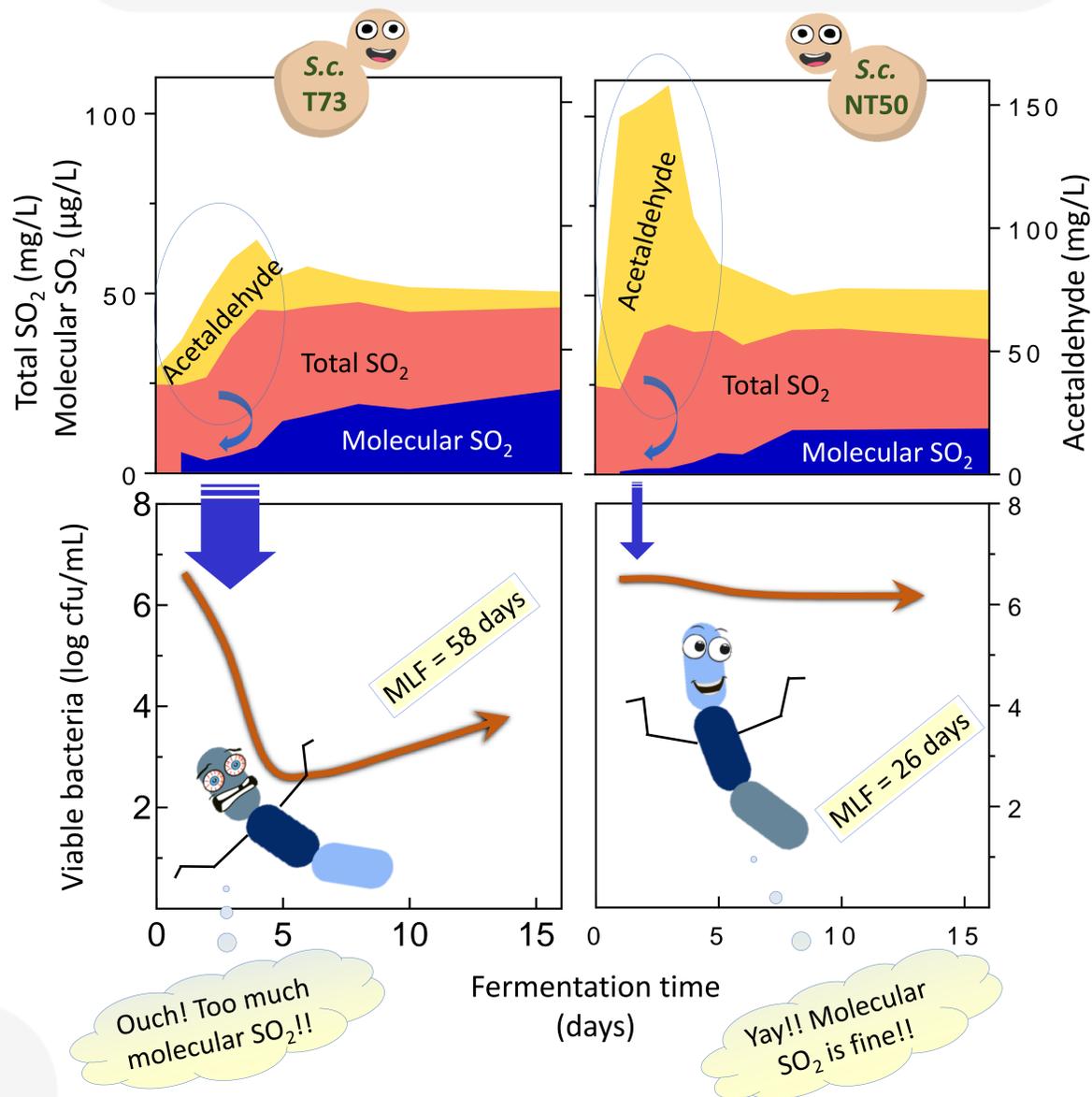
- The survival of *O. oeni* VP41™ after co-inoculation with two SO<sub>2</sub>-producing *S. cerevisiae* strains (T73 and NT50) was studied in Chardonnay must (36 mg/L total SO<sub>2</sub>, pH 3.3).
- 100 mL co-fermentations, triplicate, 17°C.
- VP41™ was co-inoculated 24hr after yeast.
- Molecular SO<sub>2</sub> concentration was calculated using acetaldehyde-bisulfite equilibria.

## Results

- Both yeast strains increased total SO<sub>2</sub> conc. to ~65 mg/L
- Bacterial viability after co-inoculation:
  - substantial decline in VP41™ viability with *S. cerevisiae* T73
  - inhibition of VP41™ alleviated with *S. cerevisiae* NT50
- Bacterial survival after co-inoculation correlated with transient formation of high acetaldehyde concentration, yielding negligible molecular SO<sub>2</sub> (<5 µg/L) at co-inoculation.

## Background

- SO<sub>2</sub> is a major barrier for malolactic bacteria performance.
- Oenococcus oeni* is highly sensitive to molecular SO<sub>2</sub>.
- >50-60 mg/L total SO<sub>2</sub> also becomes inhibitory.
- Malolactic cultures are often not compatible with SO<sub>2</sub>-producing yeast, making MLF difficult, particularly in sulfited grape must/wine.



## Conclusions

- Survival of *O. oeni* and MLF with SO<sub>2</sub>-producing yeast can be improved by co-inoculation with yeast strains that concomitantly produce an early, transient high concentration of acetaldehyde.
- The resulting high acetaldehyde:SO<sub>2</sub> ratio yields extremely low concentrations of molecular SO<sub>2</sub> in the early fermentation stage, which appears to support survival of *O. oeni*.

