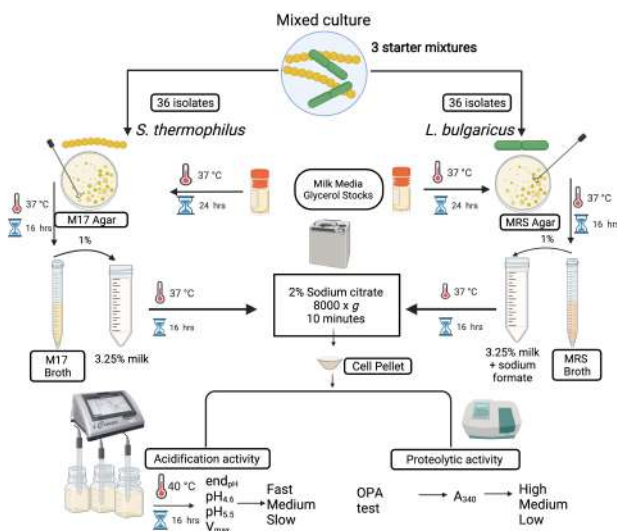


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INTRODUCTION

- During milk fermentation, the growth and acidification ability of *Streptococcus thermophilus* (*S. thermophilus*) can be improved by the peptides and amino acids produced through the proteolytic activity of *L. delbrueckii* subsp. *bulgaricus* (*L. bulgaricus*).^{1,5}
- Metabolic diversity among strains within each species leads to inconsistent performance that contributes to variation in product quality.⁵
- Strains of *S. thermophilus* and *L. bulgaricus* produce a range of flavour compounds at differing concentrations that contribute to the overall aroma profile.^{3,6}
- Screening isolates for metabolic compatibility can help understand the ideal balance between aroma such as sourness, dairy, buttery flavour and clean-cut texture of yogurt.^{2,4}
- This study aimed to characterize the phenotypic traits of acidification, proteolysis, and organoleptic traits of milk fermented by isolates found in starter cultures.

METHODS



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ACKNOWLEDGEMENTS

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RESULTS

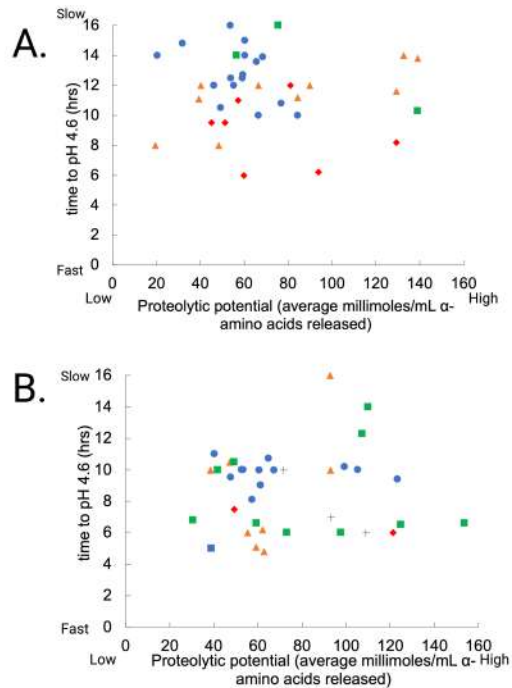


Figure 1. Correlation between acidification activity, proteolytic activity and organoleptic traits of A. 36 *S. thermophilus* monocultures, B. 36 *L. bulgaricus* monocultures. Each shape represents an aroma feature; +: intense butter, ■: butter, ▲: sour, ●: cooked milk, +: other. X axis is proteolytic activity: the measure of average millimoles/mL α -amino acids released. Y axis is the time to reach pH 4.6 during a 16 hour fermentation at 40°C using the iCinac system (AMS Alliance). All samples were tested in triplicate (n = 3).

CONCLUSIONS & PERSPECTIVES

- High proteolytic *S. thermophilus* performed as slow acidifiers whereas *L. bulgaricus* were faster acidifiers with a wide range of proteolytic activities.
- Studies on activity of *S. thermophilus* strains have shown that high proteolytic activity strains had slow acidifying activity.¹
- Aroma characteristics can be undesirable by only mixing isolates of high proteolytic activity as it can lead to bitterness due to the production of high amounts of peptides.¹
- Acidification influences the casein interactions of milk during fermentation, a rapid drop in pH over 5 hours can disrupt the strong protein-protein bonds between caseins leading to gel shrinkage and syneresis.³
- These findings can help predict starter culture performance and combine the isolates in new configurations to modulate the consumer-preferred aroma features such as sourness, cooked milk and butter.
- Future work on comparing phenotypic traits with genotype groupings of isolates can help combine isolates into mixtures.
- Next steps will be to determine aroma compounds through comparing volatile profiles of mixed cultures with isolates of interest with overall product sensory and texture properties.