Introduction

- Sparkling wine produced by the classic Méthode Traditionelle relies on yeast autolysis to produce characteristic aroma and flavour profiles and bubble formation.
- Slow, enzymatic self-degradation of yeast cells commences after secondary fermentation releasing components influencing the sensory properties of the wine with ageing.
- Visual properties of sparkling wine, including foam and bubble characteristics, are an indicator of sparkling wine quality.
- Wine polysaccharides can influence perception of body, mouth-feel, viscosity and foaming.

Aims

- Investigate effects of technologies that may accelerate yeast lysis and contribute to development of desirable autolytic character in Chardonnay and Pinot noir sparkling wine.
- Characterise foam parameters of Chardonnay and Pinot noir sparkling wines produced by addition of microwave-, ultrasound- or enzyme-treated lees at tirage in secondary fermentation, compared to standard tirage wines stored at 15°C and 25°C, respectively.
- Assess the relationship between novel treatments, foam properties and polysaccharides with ageing on lees.

Results

- Of all the treatments, storage of sparkling wine at 25°C showed the largest increase in autolytic character, relative to storage at 15°C, in sensory assessment of sparkling Chardonnay and Pinot noir wines (Figure 1A, 1B).
- Total polysaccharide contents varied between treatments and over time but were not correlated with evaluated sensory characteristics (Figure 1C, 1D).
- Enhanced foam stability was observed at 18 months in Chardonnay sparkling wines with microwave or ultrasound treated yeast additions (Figure 1E).
- Foam volume was highly variable across treatments but generally decreased with time (Figure 1G, 1H).

Conclusions

- Application of novel technologies show treatments effects which have impact on sensory autolytic character.
- Increases in autolytic character are unrelated to polysaccharide content.
- The presence of compounds in the foam, like proteins, may be responsible for foam volume variation.

Autolysis treatments have impact on sparkling wine sensory properties. Further study is required to identify compounds promoting foamability.

Figure 1A-H. Sensory assessment, polysaccharide contents and foam parameters for novel Chardonnay and Pinot noir sparkling wines compared to standard tirage at two storage temperatures (15°C and 25°C).