

Image retrieved from The metabolism behind the Merlot: Taking a look at alcoholic fermentation written by Michael Giacominato.

Figure 1. Glycolysis and fermentation metabolisms

Apple Surface Area Affects Mead Fermentation

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Figure 2. Samples collection from treatment jars

Overview

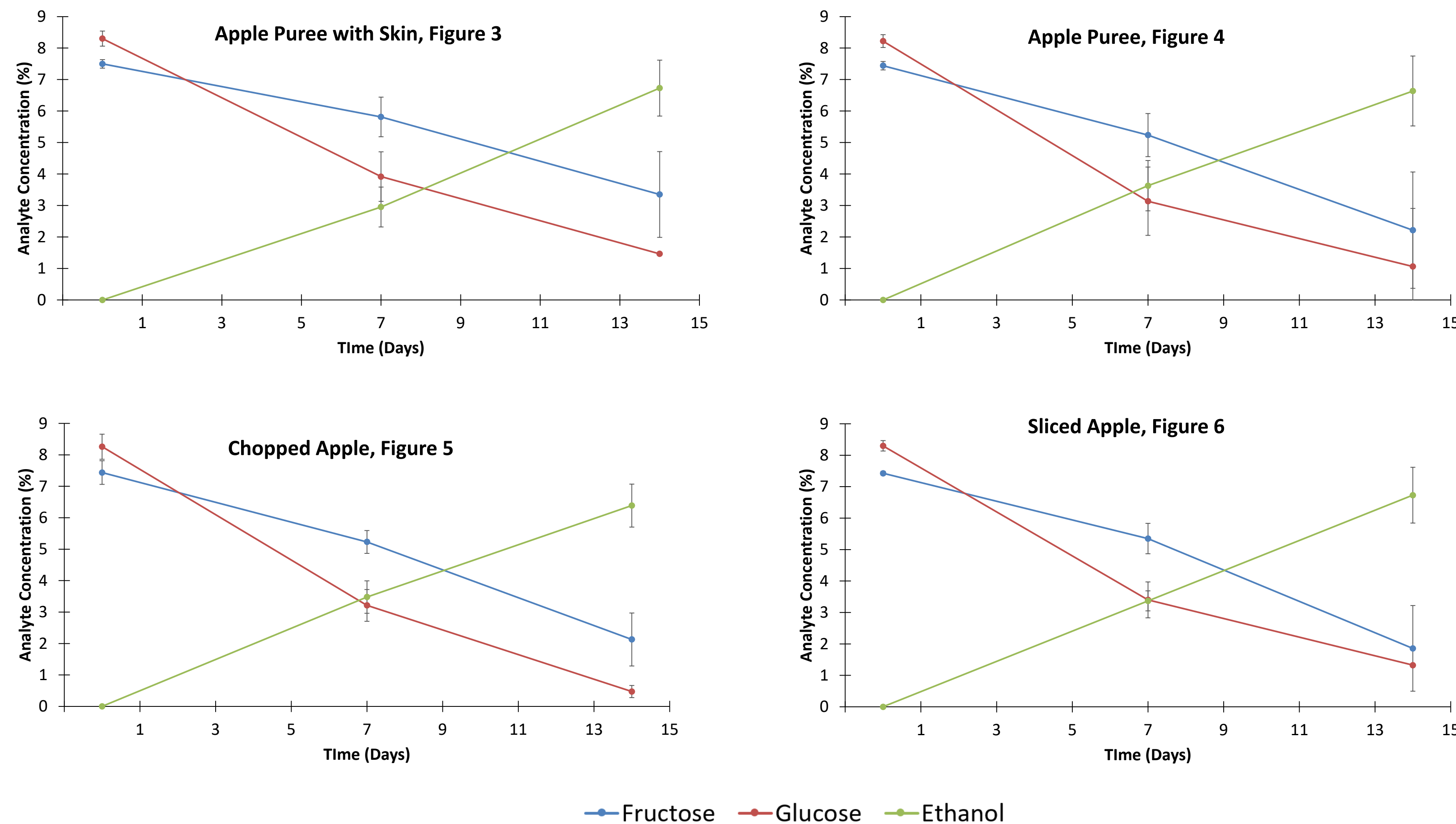
Yeast are fungal organisms that can produce energy in the absence of oxygen through fermentation (Fig. 1). This allows for yeast to produce ethanol, the key component of alcoholic beverages (Fig. 2).

This study used fermentation to produce honey wine, or mead. Apples were added with varied surface area of apple slices to expose the yeast to different levels of sugar. We studied the effect of apple surface area on ethanol concentrations in the final product (Figs. 3-6, Table 1).

Methods

Four treatments were randomly applied to triplicate jars of mead (Fig. 7). We varied the surface area of apple by adding one sixth of an apple, a finely chopped apple, pureed apple, and pureed apple with the skin present. Each treatment was sampled every seven days for two weeks. We used HPLC analysis to measure glucose, fructose, and ethanol concentrations.

Results



Figures 3-6. Data comparing glucose, fructose, and ethanol concentrations to the amount of time spent in fermentation

	Initial Concentration Percentages			Final Concentration Percentages		
	Glucose	Fructose	Ethanol	Glucose	Fructose	Ethanol
Chopped	8.3	7.4	0.0	0.5	2.1	6.4
Sliced	8.2	7.4	0.0	1.1	2.2	6.6
Pureed	8.3	7.5	0.0	1.5	3.4	5.6
Pureed with Skin	8.3	7.4	0.0	1.3	1.9	6.7
Positive Control	8.5	7.6	0.0	2.8	5.2	3.9
Negative Control	8.5	7.6	0.0	7.6	7.7	0.7

Table 1. Change in analyte concentrations over time

Conclusions

- Ethanol increased and sugars decreased consistently between treatments
- There was no difference between treatments and controls, suggesting that apple surface area had no influence on ethanol concentration in the finished product
- Our data suggest that it doesn't matter how you amend mead with apples. However, flavor may be impacted by amendment technique

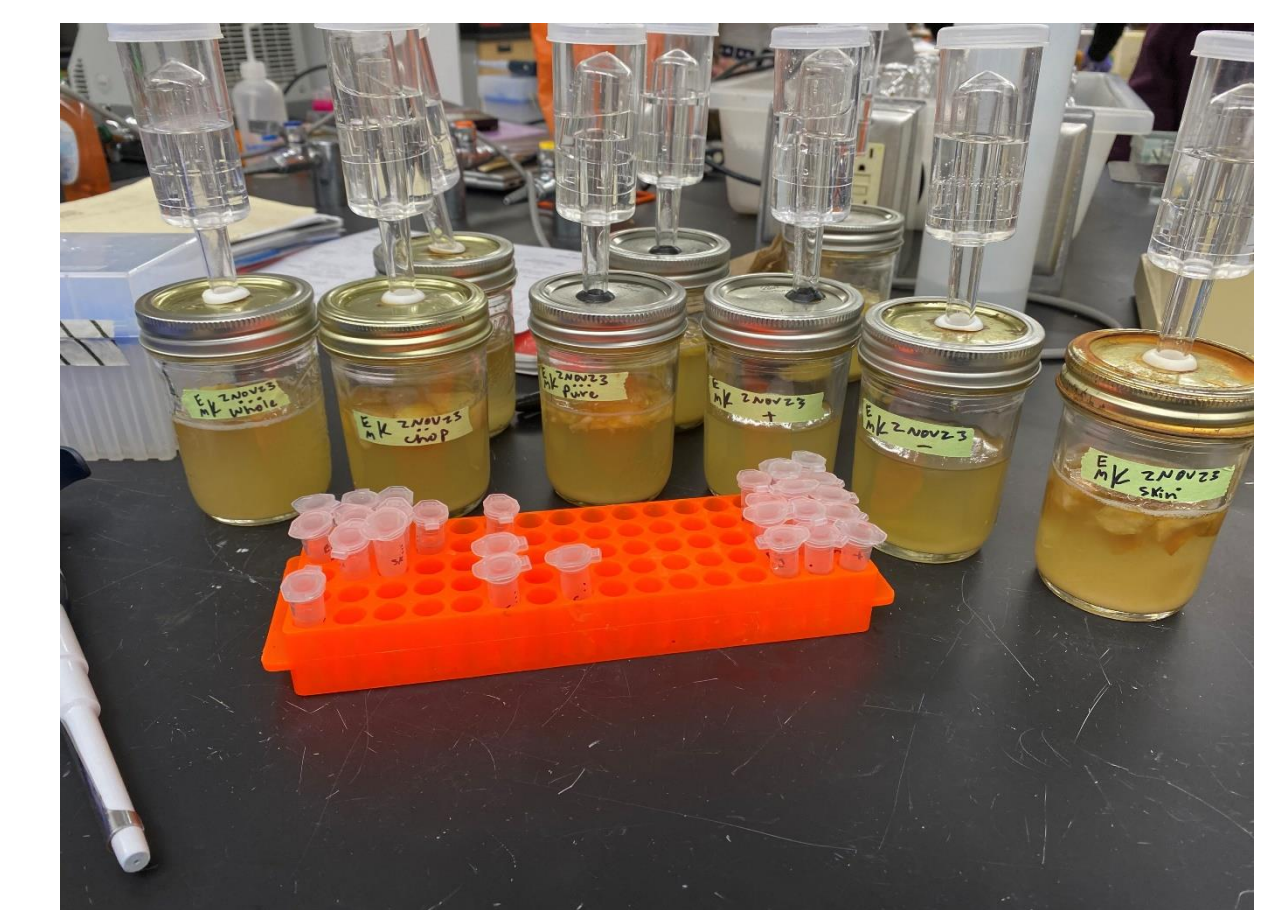


Figure 7. Mason jars with airlocks to exclude oxygen

Acknowledgements

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